

JPRS-UHR-84-025

13 December 1984

USSR Report

HUMAN RESOURCES

FBIS

FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

Soviet books and journal articles displaying a copyright notice are reproduced and sold by NTIS with permission of the copyright agency of the Soviet Union. Permission for further reproduction must be obtained from copyright owner.

13 December 1984

USSR REPORT HUMAN RESOURCES

CONTENTS

LABOR

Methodology of Drafting Labor Plans Examined (V. Rozhkova, I. Gorelik, PLANOVOYE KHOZYAYSTVO, No 6 Jan 84).....	1
Gosplan Economist on Socio-Demographic Factors in Employment (L. Chizhova; SOTSIALISTICHESKIY TRUD, No 8, Aug 84	11
Work Incentives in Technical Professions Examined (V. Kharin; SOTSIALISTICHESKIY TRUD, No 7, Jul 85).....	21
Efficiency of Rural Trade Personnel Scrutinized (M. Lerner, et al.; SOTSIALISTICHESKIY TRUD, No 7, Jul 84).....	35

EDUCATION

Changes in VUZ Admission Procedures Explained (Various sources, various dates).....	42
Efforts to Recruit Certain Specialists, Aleksandr Vasil'yevich Krupin Interview Armenian Admission Procedures, L. Garibdzhanyan Interview Ukrainian Educator on Admission Changes, V. M. Krásnikov Interview Educator Reviews Role of Entrance Exams, N. F. Krasnov Interview Improvements in Teacher Training, A. P. Petrov Interview	
Schools Accommodate Programs to Production Needs (Yu. Averichev; SOTSIALISTICHESKIY TRUD, No 7, Jul 84).....	58
Training of Environmental Protection Specialists Instituted (VESTNIK VYSSHEY SHKOLY, No 6, Jun 84).....	70

LABOR

METHODOLOGY OF DRAFTING LABOR PLANS EXAMINED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 6, Jan 84 pp 86-91

[Article by V. Rozhkova, sector chief, and I. Gorelik, senior staff member, NIITruda [Labor Scientific Research Institute]: "Methods of Justifying Labor Plans"]

[Text] Improving the system of planning and administering the economy, along with increasing the effectiveness of the entire aggregate of economic levers and stimuli of the economic mechanism is an extremely important condition for the country's rapid movement along the intensive path of development.

Administering labor is one of the basic elements of the system of administering the economy as a whole. Increasing its effectiveness depends, to a considerable degree, on improving the planning of labor--the technical-economic justification of plan assignments, and ensuring their relatively equal intensiveness. A great deal has already been accomplished along these lines: the methods of the technical-economic justification of the changes in labor outlays under the influence of the basic factors of the growth in labor productivity have been improved, and various normative materials which can be used as criteria in administering labor have been created. The appropriate materials have been placed into the foundation of the methodological decrees of USSR Gosplan with regard to compiling plans on labor. Unfortunately, however, these decrees have not always been utilized in the practice of planning. This pertains, above all, to calculating the magnitude of the changes in labor outlays, on the basis of which the sources ensuring labor savings are subsequently determined. Such a calculation by the planning organs, establishing the assignments with regard to the growth in labor productivity for the ministries, industrial associations and enterprises, is conducted solely with regard to the dynamics of the total production volumes in value terms, without taking into account the changes occurring in their assortment. As a result, the level of assignment justification is not high enough always, nor are the plans inter-coordinated. Furthermore, such planning does not facilitate the orientation of enterprises toward fulfilling the plans for product deliveries on the entire assortment provided for by the contracts, inasmuch as it does not allow them to be guaranteed the necessary labor resources.

Changes in the assortment of the products being turned out significantly affect the magnitude of the labor outlays. Assignments with regard to the growth of labor productivity, set without taking these changes into account, have proved to be of differing intensity for enterprises, primarily because they

unevenly influence the necessity for using such factors of growth in labor productivity as raising the technical level of production, improving the organization of production and labor, and so forth. As has been shown by a research study conducted by NIItrud, despite the introduction of new wholesale prices and net production norms, variable profitability of producing the same goods at different enterprises has been preserved, as well as different goods at the same enterprise by virtue of the existing differences in the economic conditions of production. Thus, in the 1982 plan, according to the data from more than 320 enterprises of 15 ministries, on an average, the differing profitability of producing various types of output at one enterprise, as calculated by the wholesale prices in relation to labor outlays differed by a factor of 14.6, while, as calculated with regard to the norms of net production--by a factor of 10.7.

Changes in product assortment, as was shown by a study conducted at 161 enterprises of 11 ministries, failed to exert an influence on changing the labor outlays in only five enterprises. At more than half (53.4 percent) of the enterprises they increased the labor outlays on the production of output by 40 percent, as compared with the magnitude of the relative freeing up of the workers in accordance with the plan for increasing labor productivity, and by 3.6 percent--in comparison with the magnitude of the original number of workers, as adopted in justifying the plan for the increase of labor productivity. And, in contrast, at 43.5 percent of the enterprises shifts in the product assortment provided an average of 36 percent of the savings in labor outlays, which comprises 2.6 percent of the original number of workers, and they determined 2.7 percent of the growth of labor productivity. At more than 20 percent of these enterprises the savings on labor outlays exceeded the relative freeing up of the number of workers in accordance with the plans for increasing labor productivity by an average factor of 2.2.

Inasmuch as the influence of the assortment shifts was not taken into consideration in drawing up the plan, the enterprises at the first of the indicated groups did not determine the sources for obtaining additional sources of labor savings. As a result, the set tasks with regard to labor productivity and product assortment have not been fulfilled, and the stability of the plan has not been ensured. The enterprises of the second group, in contrast, have less intensive plans, and some of them can fulfill their assigned tasks without utilizing the actual factors of the growth in labor productivity and without reducing the labor intensiveness of production.

Thus, in connection with the fact that the shifts in the product assortment are not taken into account in planning labor productivity, the justification of the ensuing determination of the changes in labor outlays under the influence of other factors is reduced, nor is there provided an inter-coordination between the corresponding indicators of the plans with respect to the product volume and assortment, the growth of labor productivity, the improvement in the utilization of workers' time, and the increase of production efficiency. As a result, the fulfillment of certain indicators, for example, with regard to growth of labor productivity, has been frequently achieved at some enterprises at the expense of non-fulfillment of other indicators, for example, such as product assortment.

The lack of balance between the plans on labor and the sources of obtaining savings on labor outlays cannot fail to have a direct reflection on their fulfillment. Thus, at the production association of the Turbine-Motor Plant imeni K. Ye. Voroshilov under the jurisdiction of the Ministry of Power Machine Building the 1982 plan did not provide sources for freeing up 1,651 persons, or 92.8 percent of the magnitude set by the plan for increasing labor productivity. The enterprise failed to fulfill the plan with regard to the growth of labor productivity (the plan had set 14.3 percent, whereas the actual amount reported was 7.3 percent), or with regard to product assortment. At the Yasinovatskiy Machine-Building Plant the magnitude of the relative freeing up of workers not provided for by sources in the plan amounted to 409 persons, or 50.2 percent. This enterprise over-fulfilled the plan with regard to growth in labor productivity (the plan had set 22.4 percent, whereas the actual amount reported was 24.1 percent) by means of changing the assortment in the direction of less labor-intensive production and obtained by means of this a relative freeing up of 375 persons. Violations of the plan discipline, unfortunately, are quite widespread, but the practical work of planning does not facilitate the elimination of these shortcomings. The plans being worked out do not always exert the necessary influence on labor savings and, hence, cannot serve as a reliable basis for administering labor and increasing the efficiency of economic levers and stimuli.

One of the causes hindering an increased justification in determining the increase in labor productivity by factors is the fact that, over the course of many years, despite the existing methodological and organizational prerequisites, the plan organs have not adopted the necessary measures for organizing the accounting of labor outlays by types of products.

At the present time the system of norms and quotas includes, along with norms of time (production), personnel and servicing quotas, an indicator of the overall labor intensiveness of a real unit of production, as estimated on the basis of the product list and corresponding to the current lists of wholesale prices and the norms of net production. Utilization of such an indicator creates the objective prerequisites for raising the level of the technical-economic justification of plans. The indicator of the actual complete labor intensiveness of a product reflects the labor outlays for the entire industrial-production personnel, i.e., those which are likewise taken into account in the indicator of production output, as expressed in value terms. The nature of the labor outlays, as reflected by the indicator of complete labor intensiveness, allows us to utilize the existing information and the adopted methodology of justification with regard to the factors of changes in labor outlays in the plan. The differences between the indicators of the actual complete labor intensiveness of the product and the production output in value terms consist primarily in the fact that the former is calculated per real unit of each type of product, while the latter is calculated in value terms and characterizes the aggregate volume of production. In the first of the indicators the labor outlays are expressed by the hourly resources of workers' time; while in the second they are expressed by the yearly resources.

In order to harmonize the dynamics of both indicators in the plan, it is necessary to calculate the influence of shifts in the product assortment and the improvement in utilizing workers' time on the dynamics of change in labor outlays.

The difference between the magnitude of the relative freeing up of the number of workers, as defined in the plan for increasing labor productivity, and the change in labor outlays under the influence of these two factors will also characterize this magnitude of the relative freeing up of a number of workers by means of reducing the complete labor intensiveness of production, which is necessary for carrying out the plan assignments which have been set. When the indicator for setting norms for the technological labor intensiveness of production is used, it is practically impossible to carry out such a coordination of the plan indicators.

The complete labor intensiveness of production, along with the balance of the time of one worker, ought to become the basic indicator within the system of administering the reduction of labor outlays. It would be feasible to approve them in the plans. The assignments ought to specify the sources for obtaining labor savings. Having determined the plan indicator of the savings in labor outlays obtained from reducing the complete labor intensiveness of production and the influence on it of the changes in production volume, cooperative deliveries, natural conditions, and sectorial factors, we can calculate the effectiveness of the organizational-technical measures determining labor savings necessary for carrying out the tasks which have been set. After this a plan can be worked out for increasing production efficiency, and then the magnitude of the plan labor intensiveness can be calculated by types of products.

Assortment shifts exert a substantial influence on the dynamics of the value indicator because they must be taken into special account in planning at all levels. Only enterprises have plans for the delivery of products by contracts in which the assortment is specified in detail, as well as the indicators of the labor intensiveness involved in producing it. In connection with this, the influence of shifts in the product assortment on the changes in labor outlays can be calculated most precisely on this level. On the basis of indicators specified at the enterprises, planning must be carried out at a higher level--this brings about the need for a higher level of justifying the indicators to be worked out at the enterprise. It is also precisely in such a way that labor savings, under the influence of specific factors (improvement in the utilization of workers' time, a change in the volume of production and cooperative deliveries, a rise in the technical level of production, etc.) can be determined only at the enterprise level. This must be taken into consideration in planning, utilizing within the centrally established control assignments the technically and economically justified indicators, as worked out at the enterprise.

Simultaneously with this, we must change the practice of evaluating the influence of each factor on the increase of labor productivity. This influence must be calculated by proceeding from labor savings by means of factors of real growth in labor productivity. Data obtained in such a way must be taken into account in forming the wage fund and determining its average magnitude, exercising banking controls over the expenditure of this fund, organizing the stimulation of growth in labor productivity, forming economic incentive funds, calculating the correlations between the growth of labor productivity and wages.

The system of administering the reduction of labor outlays, along with the object of administration--the complete labor intensiveness of production--must include criteria which would allow us to objectively evaluate the magnitude of the labor intensiveness of production at each enterprise and, consequently, also the existing reserves for reducing it. As such criteria use can be made of progressive normatives of labor outlays, while in certain sectors use can also be made of the indicators of planned labor intensiveness of production.

The work being conducted with regard to forming indicators of the complete labor intensiveness of production is of great significance for implementing another, no less important, trend of increasing the justification of plans--ensuring their relatively equal intensiveness. The decree entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Upgrading Work Quality" places particular emphasis on the inadmissibility of setting the plan assignments merely from the dynamics of the indicators which have taken shape. It provides for the necessity of developing methods of a quantitative evaluation of the intensiveness of the plans; such methods must increase the objectivity of the assignments, the responsibility and motivation of the workers at the enterprises to make the fullest possible use of intra-production reserves. The methodological directives concerning the procedure for determining the intensiveness of the plans worked out to implement this decree and approved by USSR Gosplan¹, contain the basic principles and approaches to such an evaluation. In accordance with them, a plan is deemed to be intensive if it ensures the fulfillment of the set assignments and the optimal utilization, on the normative level, of the production capacities and outlays of material, labor, financial, and other resources. Evaluation of the intensiveness must be based on a determination of the degree of utilization of resources; moreover, the normatives must reflect the optimal level of this utilization. Until such normatives have been worked out, evaluation of the intensiveness of the plans is to be conducted by means of comparing the plan indicators of a given enterprise with the achievements of the exemplary enterprises of an analogous nature of production, i.e., a quantitative evaluation of the intensiveness of the plan assignments presupposes the comparability of the indicators of various enterprises. However, the indicator of production output in value terms, as calculated per worker, cannot be used for comparison, inasmuch as the labor results therein are expressed as an aggregate volume of production, the structure of which is varied. In order to carry out such an evaluation, use can be made of the indicator of complete factory-plant labor intensiveness of production, which reflects labor outlays on specific types of output in physical terms and which, therefore, can be used in comparative characterization of the activities of various enterprises.

In order to evaluate the intensiveness of plans, use must be made of the normatives of labor outlays. The methodological problems of working them out are of great importance; however, they are not provided for in the methodological directives concerning the procedure for evaluating the intensiveness of plans.

In determining the normatives of labor outlays, we must take into account, first of all, the basic differences in the objective conditions of producing the same product at a sector's enterprises. These differences are extremely significant, as studies have shown. For example, the production scales of tires, petroleum-refining products, and synthetic rubber at enterprises of the

USSR Ministry of the Petroleum Refining and Petrochemical Industry differ by a factor of 3--5, those of boilers at enterprises of the Ministry of Power Machine Building--by a factor of 7, and those of cement at enterprises of the USSR Ministry of the Construction Materials Industry--by a factor of 11. The level of production specialization at enterprises engaged in the output of certain types of products differs by a factor of 1.5 in the production of isoprene rubber, by a factor of 40 in the production of tires for passenger automobiles, and by a factor of more than 46 in boiler-making; the indicators of the technical capital-labor ratio of workers differ by a factor of 1.5 at enterprises of the Ministry of Power Machine Building and by a factor of 8 in the non-metallic sector of the USSR Ministry of the Construction Materials Industry. The parameters of the equipment being used are also unequal. For example, the hourly productivity of the rotary kilns at the cement enterprises studied differ by a factor of 9, of cement mills--by almost 11, etc. In the extractive sectors of industry the differences are also great under the natural conditions of production.

Unequal conditions of production also bring about differences in the magnitude of the complete labor intensiveness of the same production. In petroleum refining, for example, the complete, actual labor intensiveness of a unit of the same product differs at enterprises by a factor of 6--12, while in the production of sulfuric acid, phosphoric acid, and sodium sulfate--it differs by a factor of 3--18.

In the machine-building sectors the differences in the magnitude of complete labor intensiveness are less significant. Even there, however, these indicators at enterprises differ in many cases by a factor of more than 2.

In connection with the differences in the levels of concentration, specialization of production, the technical and technological extent of equipment, as well as the natural conditions of production in the extractive sectors of industry, the normatives of labor outlays being worked out cannot be sectorial in nature--they must be group- or individual-types for homogeneous products, differentiated by technical-design parameters, or the same type of products being manufactured under particular conditions of production.

Calculation of such normatives presupposes the conduct of an inter-plant, comparative analysis and the establishment, on its basis, of general principles for changing the magnitude of the labor intensiveness of production, depending on the differences in the objective conditions of production, while in the case of determining the normatives with regard to homogeneous products--in the technical and operational characteristics.

Comparison of the labor intensiveness of production can be conducted either with respect to the entire production cycle of manufacturing a product at an enterprise or with respect to individual technological processes (production lines, types of operations). Selected as objects for comparison may be finished items of the same or homogeneous design, designation, and manufacturing technology, or a product of individual processing operations (types of work).

In those sectors where a significant number of enterprises produce the same product (coal, timber, a number of sub-sectors of the construction materials

industry, the food and light industries) it is possible to compare the labor intensiveness of production with regard to the entire production cycle of its manufacture. In machine building such comparison, as a rule, can be carried out with regard to groups of homogeneous products, which brings about the need to determine the boundaries of its homogeneity.

In the industrial sectors with a large proportional share of modified products and a high level of items with standardized designs the labor intensiveness can be compared with regard to the same or homogeneous leading design units and parts.

In selecting any direction to be followed in developing normatives, it is necessary, in the final analysis, to ensure the possibility of determining the normative for a finished manufactured product.

Selection of indicators for the purpose of characterizing differences under the objective conditions of production output or within its technical-design parameters is conducted on the basis of a logical analysis with a subsequent verification of the results with the aid of statistical methods. The methods for establishing the quantitative dependence of the labor intensiveness of production on the factor-type indicators have been set forth in the methodological recommendations of NIItrud [Labor Scientific-Research Institute]².

In accordance with these recommendations, an analysis was conducted on the influence of production conditions on the labor intensiveness of production with regard to certain groups of the same and homogeneous products (the harvesting and shipping out of timber on timber-management enterprises of the RSFSR Ministry of the Fuel Industry, mining coal in the mines of this same ministry, making tires for passenger automobiles at enterprises of the Ministry of the Petroleum Refining and Petrochemical Industry, motor-vehicle generators at enterprises of the Ministry of the Automotive Industry, etc.). Moreover, factors were selected which exert a basic influence on labor intensiveness, and indicators were excluded which have a close, correlative link with the already selected factors and a less significant link with the labor intensiveness of production. Regressive equations were drawn up with the aid of which the average calculated values were determined for the labor intensiveness of the products being analyzed with regard to each enterprise, reflecting the aggregate influence of the selected factors. If the magnitude of the calculated labor intensiveness did not differ substantially (within the bounds of 10 percent), these enterprises were combined in a single group as having relatively the same objective conditions of production. For the other enterprises a system of adjustment coefficients was worked out, taking into consideration the influence on the labor intensiveness of production of differences under the conditions of their production or in the design of a homogeneous product. The normatives were also set depending on this: group normatives--for enterprises with comparatively similar objective conditions of production and individual normatives for each enterprise having specific conditions of production; moreover, the individual normatives were designed, taking generally established principles into account.

Analysis of the values of the calculated magnitude of the complete labor intensiveness of the harvesting and shipping out of timber on the timber-management enterprises of the RSFSR Ministry of the Fuel Industry has shown that 23

enterprises out of 25 can be grouped in four groups. The magnitude of the deviations in the values of the calculated labor intensiveness with regard to each timber-management enterprise from the average for the group did not exceed 7.9 percent. Following the same principle, 14 out of 15 coal mines under the jurisdiction of the RSFSR Ministry of the Fuel Industry were grouped in three groups with a magnitude of deviations in the labor intensiveness of at least 7.2 percent. A unified (grouped) quota was established for each group of enterprises. For the two timber-management enterprises and one mine not included in the groups in connection with existing differences in the conditions of production, individual normatives were specified.

The normatives of the labor outlays should reflect not the average but the progressive level of utilization of the objective conditions of production, as achieved at the enterprises of each group. The degree of progressivity can be varied. As progressive, for example, one could use a normative whose magnitude corresponds to the indicator of the average labor outlays, as calculated for those enterprises at which the actual labor intensiveness of production was lower than the average for the entire group of enterprises. Thus, at eight mines of one of the groups which was studied the magnitude of the complete actual labor intensiveness of coal mining ranged from 4.3 man-hours to 7.8 man-hours. At five mines the magnitude of the labor intensiveness of coal mining was lower than the average value (6.05 man-hours) for the group. The average magnitude of labor intensiveness with regard to these five mines was equal to 5.3 man-hours. It was adopted as a progressive normative.

The deviation of the actual labor intensiveness from the normative characterizes the magnitude of the reserves which can be implemented under the given production conditions at the enterprises. These reserves should be taken into account in establishing the plan assignments with regard to growth in labor productivity. At those enterprises at which the actual labor intensiveness of production is lower or corresponds to the established normative, in order to evaluate the existing reserves, use can be made of the indicator of the least labor intensiveness in the given group of enterprises.

An analogous approach to working out normatives is used in determining individual normatives. The methods for establishing them have been provided for in the indicated NIItrud methodology.

The sectorial institutes ought to work out the sectorial methods and normatives of labor outlays for production output. The effective time period of the normatives depends on the changes in the conditions of production output. The normatives can also be established, taking into account the changes being planned in the production conditions in the five-year plans. This will allow us not only to raise the degree of the progressivity of the normatives but also increase the time period of their effectiveness.

There is no need to work out normatives for all groups of products in order to evaluate the intensiveness of the plans. In the first place, they must be defined by basic types of profiling products, as well as by types of products the conditions of whose manufacture differ significantly. Subsequently, the normative base may encompass a wider range of products.

In machine building there is quite often a change in the type of product being manufactured; hence, the normatives must reflect the differences not only under the conditions of the production line which has been mastered but also, by stages, the mastery of the output of new products. The methods for taking such changes into account are cited in the above-mentioned MII-trud methodology.

In large-serial, mass, and serial alternate-assembly-line production facilities in machine building the indicator of the plan labor intensiveness of production can be used as a criterion.

In order to make practical use of normatives at enterprises in evaluating the reserves for reducing labor intensiveness and the intensity of plans, it is necessary that they include information as to which group the enterprise is included among with respect to the objective conditions of production, by what criteria this group was formed, what enterprises produce items under analogous conditions of production, and what is the magnitude of the labor intensiveness of production (by stages of manufacture) at each of these enterprises.

Working out the indicators of the complete labor intensiveness of production also presupposes a specification of the normatives of labor outlays. However, this work requires an adjusted accounting of the actual labor outlays on the production of individual types of products. In a number of ministries--the Ministry of the Petroleum Refining and Petrochemical Industry, the Ministry of Power Machine Building, the Ministry of the Automotive Industry, the USSR Ministry of Geology, the RSFSR Ministry of the Fuel Industry, the ministries of local industry of a number of republics, and others such an accounting does exist, and the leading sectorial organizations have proceeded to analyze the differences in the labor intensiveness of manufacturing the same (or homogeneous) products and to discovering the causes determining them. Based on such studies, progressive normatives of labor outlays will be worked out. Utilization of such normatives will allow us to more fully reveal the reserves for reducing labor outlays, to more specifically work out measures for implementing these reserves.

A system for administering the reduction of labor outlays should include the following: the object of administration--the actual labor intensiveness of production; the criteria of administration--the normatives of labor outlays on products mastered by production and new products, and the methods of discovering and evaluating reserves for reducing the labor outlays, methods of planning them in coordination with the assignment being established continuously for all levels of the value indicator of labor productivity, forms of economic, material, and moral stimulation of carrying out the established assignments with the least labor outlays. Working out all these elements of the system will allow us to more effectively influence the reduction of labor outlays in administering the economy and will facilitate the intensification of socialist production.

FOOTNOTES

1. See *Ekonomicheskaya Gazeta*, No 5, 1980.

2. See: "Planirovaniye snizheniya trudoyemkosti i razrabotka normativov trudovykh zatrat na proizvodstvo produktsii. Metodicheskiye rekomendatsii" [Planning the Reduction of Labor Intensiveness and Working Out Normatives of Labor Outlays for Production Output: Methodological Recommendations], Moscow, Izd. NIItruda, 1981; "Opredeleniye trudoyemosti izgotovleniya novoy produktsii. Metodicheskiye rekomendatsii" [Determining the Labor Intensiveness of Manufacturing New Products: Methodological Recommendations], Moscow, Izd. NIItruda, 1980.

COPYRIGHT: Izdatel'stvo "Ekonomika", "Planovoye khozyaystvo", 1984

2384

CSO: 1828/3

LABOR

GOSPLAN ECONOMIST ON SOCIO-DEMOGRAPHIC FACTORS IN EMPLOYMENT

Moscow SOTSIALISTICHESKIY TRUD in Russian No 8, Aug 84 pp 89-95

[Article by L. Chizhova, section chief, NIEI [Scientific-Research Economics Institute], under USSR Gosplan, candidate of economic sciences: "How to Make Better Use of the Labor of Various Socio-Demographic Groups of the Population"]

[Text] At the present-day stage, when resolving the problems of increasing the effectiveness of labor in the national economy, great importance is attached to the differentiated approach to the study of the labor activity of various sex and age groups of the population during definite periods of their life and work.

In our research we isolated four periods of labor activity through which, as a rule, everyone passes. In conformity with this, we define the following groups of the population: young people (16-29 years); middle-aged people (30-49 years); people of preretirement age (50 years and older); and retirees for reason of age (women 55 years and older, men 60 years and older). Of course, within these groups one also differentiates smaller subgroups, which are typified by a particular level of education, type of occupational training, and the ability to adapt to changes of production and of labor conditions, to change from one sphere of activity or branch of the economy to another. But we have dwelt in this instance on this consolidated grouping in order to analyze the most general tendencies in this area.

The level of employment rate in the country's social production, when judged by the socio-demographic groups during the past quarter of a century, has been fairly stable (see table).

The highest indicators typified the middle-aged persons (30-49 years). The difference in the levels of employment rate for men and women were somewhat reduced. But the lowest level of employment rate in social production is retained for young people, inasmuch as, in the activity of this sex and age subgroup, a large place is occupied by training as a necessary condition not only for raising the educational level of the entire population, but also for improving the manpower structure with regard to vocational proficiency. Young people are drawn upon to renew the cadres of workers and to train the specialists among the medium-level and higher technical personnel and the

administrative apparatus. All this rather large group can be subdivided into subgroups: young students and young workers.

[Table]

Level of Employment Rate According to Socio-Demographic Groups (in %)*

Year	Young people (16-29)	Middle age (30-49)	Preretirement age (50 years and older)	Retirees on the basis of age (men 60+, women 55+)	Men	Women
1959	78	80	70	23	89	69
1970	74	93	80	13	88	82
1979	76	96	84	11	87	84

The 1979 population census indicated that, of all the young people aged 16-29 years, approximately three-fourths worked at state enterprises, institutions, and organizations. More than 20 percent were engaged in full-time off-the-job instruction. The largest share of the students is the age group 16-24 years. Among them, almost one-third are students.

The "Basic Directions in the Reform of the General Educational and Vocational School System, which were approved by the Plenum of the CPSU Central Committee and the USSR Supreme Soviet in April 1984 provide for a considerable improvement in the use of the labor potential of schoolchildren. "Guaranteeing the high level of knowledge that is necessary for continuing their training in an institution of higher learning," that document states, "the school at the same time must orient the young people toward socially useful labor in the national economy and must train them for this" ("Materialy pervoy sessii Verkhovnogo Soveta SSSR odinnadtsatogo sozyva" [Materials of the First Session of the USSR Supreme Soviet, 11th Convocation], Moscow, Politizdat, 1984, p 49). That means that labor indoctrination should be viewed both as a very important factor in the formation of the individual and as a means of satisfying the national economy's needs for labor resources.

As a result of the vital importance of the task of accelerating scientific-technical progress, there arises the question of the more thorough study and substantiation of the recommendations for the optimizing of the proportions in the distribution of young people between young workers and young students. It is important to consider the fact that training is a mandatory condition for achieving a higher qualitative level among the manpower. The higher the overall and occupational training of the worker, the more efficient the employment rate of workers in the national economy will be throughout their entire labor career and the longer that entire labor period will be. As has been shown, for example, by the materials of the 1979 population census, among the men and women who are older than the able-bodied age, the ones who considerably more frequently continue to work are those who have a high level of education. For example, whereas for the age group of men aged 60-64 years as a whole, 29 percent were working, among those who had higher education the

figure was 54 percent; and among women aged 55-59 years, the ones who were continuing to work constituted, respectively, 29 and 46 percent. Consequently, the higher level of education determines the greater labor participation rate in the older age groups.

It is well known that at the present time we have achieved a rather high level in the overall education of young people. But it is no less well known that instruction, the accumulation of knowledge, is still being combined with insufficient efficiency with preparation for labor in social production. Almost 40 percent of the young people entering labor life do not have vocational training, and this cannot fail to reduce the effectiveness of their labor.

In the course of carrying out the reform of the general educational and vocational school system, provision is made for the considerable expansion of the training of qualified work cadres in the system of vocational and technical instruction and the carrying out of a changeover to the universal vocational education of young people.

The resolution of the problem of education and the employment rate of young people means that both the instruction and the employment rate of young people must contribute not only to the achievement of a higher level of proficiency among the personnel, and the rise in labor productivity at the particular time, but also to the better retention by the person of its able-bodied condition until the end of his labor life and to the guaranteeing of the necessary conditions for the reproduction of the population. In this regard it seems to us that the question of the work loads that arise as a result of the broadly employed instruction without release from the job requires additional study. In the 1981-1982 school year 43 percent of the students in higher educational institutions were attending without being released from the job; in secondary special institutions, 37 percent; and in PTU [vocational-and-technical schools] (TU[technical schools]), almost 17 percent. Approximately 46 percent of the total number of students in day schools (grades 9-10) and night schools attended evening (shift) general educational schools. On the whole, the share of those combining work with training was approximately one-third of all the students. And their number is not decreasing. This also gives rise to undesirable factors. First, the quality of general-educational training and the instruction of qualified workers and specialists without releasing them from the job is inferior to the quality of the training in the day departments, and this is especially important when the students are studying complicated modern occupations and specialties. Secondly, the excessive work load that proves to be the share of those young people who are working while attending school cannot fail to have an effect subsequently upon their health and upon their family and marital relations.

The correlation that has developed in the practical situation between day and evening or correspondence education and instruction should be analyzed from scientific positions, with the involvement of a broad group of specialists. It is important to analyze objectively what is more effective: a high level of employment rate in social production during the young years, or a certain "delayed payment" in order to obtain a good vocational and fully valid general-educational training at noncorrespondence educational institutions

during youth, in order to increase the labor return when the person is in the middle-aged or older category, when he has had a large amount of occupational experience.

In our opinion, the interests of the intensive development of the economy and of effective demographic policy require that the training of qualified workers and specialists should be carried out, as a rule, full-time, with release from the job. Of course, this method leads to a reduction in the number of workers for the national economy. At the present time, approximately 5 million persons aged 16-29 years are being instructed without being released from the job. It would be possible to compensate for those losses by using broadly the labor of students in operations involving an incomplete work day during the time when they are free from taking instruction. That will make it possible to guarantee more successfully the needs of the production branches and the services sphere in the sectors where simple, relatively unskilled, and manual operations are still being employed. According to approximate estimates, the involvement of young students in certain types of operations with an hourly employment rate will make it possible additionally to have several million working hands. Sociologists and psychologists note that a young worker is more eager to take a job in work stations with unfavorable working conditions if he knows that his employment in that instance is only temporary.

Among the basic directions for increasing the effectiveness of the use of the labor performed by young people, with a consideration of the goals of the demographic policy, an important role is played by improving the working conditions and the nature of the labor. In this instance we have in mind the acceleration of the elimination of heavy manual labor, the mechanizing of the production process, and the creation of comfortable conditions at every work station. Here the chief path is the getting rid of obsolete equipment, the introduction of progressive technology and organization of labor.

In the national economy at the present time we are observing the insufficient use of a considerable amount of equipment because of the fact that, on the basis of its ergonomic characteristics, it does not meet the increased requirements of the workers with regard to the working conditions and the content of the labor. As a result of the rise in the standard of living and educational level, when selecting an occupation, and this pertains especially to young people, the factors that most frequently come into the foreground are the prestige level of the various operations, the possibility of occupational advancement, favorable working conditions, etc. The retention of obsolete equipment in the national economy by no means conforms to the increased social needs of the workers.

A very important direction in increasing the efficiency of the use of the labor of young people is the elimination of the disproportions in the distribution of the young men and young women within the confines of a particular territory, and also by branches of the national economy. In addition, the composition of the young people on the basis of sex is substantially different when viewed by republics. For example, in villages on the larger part of the European part of the country, the number of young men is considerably greater than the number of women.

The lack of conformity in the makeup of young people according to sex creates, all other conditions being equal, additional difficulties in the formation of families, leads to a drop in the birth-rate indicator, and intensifies a situation in which young people desert the villages. And yet it is precisely the growing need for young mechanizers that today characterizes the situation with regard to personnel in the rural areas, especially in the Nonchernozem Zone of the country. The problem of achieving a balance between the work stations filled according to sex can be resolved by creating qualified work stations for women in the social economy of the rural area.

In the cities of the European part of the RSFSR, the Ukraine, Belorussia, and the Baltic republics, it would appear at first glance, there are no special problems. The correlation between the men and women of young ages there is practically identical, with a slight predominance of women. However, definite difficulties arise not infrequently because of the fact that predominantly male and predominantly female branches and occupations have developed there. In and of itself, this is natural. But when there is a considerable predominance of persons of a particular sex at an enterprise, that not only limits the opportunities for the young people to find a matrimonial partner, but also worsens the psychological climate in the collective.

Other problems arise in the cities and the rural locality in the Central Asian republics. Migrants from the village to the city in these republics, from the point of view of their makeup, differ greatly from the migrants to the European part of the country. Whereas the people in the RSFSR, BSSR, and UkSSR who primarily migrate from the rural areas are girls, in Central Asia it is the young men, for the most part, who make their way to the cities. Therefore in the Central Asian republics it is necessary to increase the attention to raising the occupational education of the indigenous population, and especially the young women. That will help to speed up the change of the traditional way of life and will promote the more active migration to the cities not only of young men, but also of young women. Naturally, in order to resolve efficiently the question of finding jobs for them, it is important to create in the cities a sufficient number of jobs with a consideration of the specific features of the population contingents arrived from the rural rayons.

The socio-demographic group that is made up of able-bodied men and women aged 30-49 years is characterized by the high level of employment rate in social production. Throughout practically the past 20 years, everyone in this population group has been working. This situation is completely understandable, inasmuch as it is precisely after the age of 30 years, as a rule, that the person has finally selected an occupation, accumulated production experience, has determined his or her place of work, has diminished migrational mobility (as compared with young people), and most people have a family. In other words, the time has come for the most effective period in the person's labor life. Therefore it is precisely in the use of the labor of this group that one finds the greatest opportunities for increasing the effectiveness of the functioning of production. However, while being concerned about obtaining the greatest return from this socio-demographic group, it is important to proceed from the need to preserve a rather high level of capability for labor subsequently, beyond the half-century limit.

An analysis of the employment rate of middle-aged persons by branches and occupations provides the opportunity to determine those directions along which it is possible and necessary to improve the use of the labor of this group.

The differentiating feature of middle-aged persons lies in the fact that they are employed chiefly in work that requires high occupational skill, which is formed under the influence of practical experience, rather than only their education. Such work, as a rule, is well paid. People aged 30-49 years constitute the majority among the representatives of the administrators of enterprises in industry, construction, agriculture, timber management, transportation, communications, and their structural subdivisions (shops, sectors, etc.). This group also includes engineer-technical personnel. In the specialist categories that have been mentioned, the share of this age group in 1979 constituted more than 65 percent. There is also a high share of persons aged 30-49 among the persons employed in the administrative positions in the branches of the services sphere (more than 55 percent); they also constitute a considerable part of the highly qualified workers (for certain occupations, more than 50 percent). Persons aged 30-49 years more frequently than other workers are employed in physical heavy labor, and not infrequently it is also simultaneously complicated work, so that the combination of these factors explains their high wages (the basic occupations in the extractive and metallurgical industry, in transportation, etc.), although not infrequently these are people with incomplete secondary education.

Under conditions of scientific-technical progress, for the more effective use of the labor performed by this group of the population, a factor of substantial importance is the improvement of occupational skill, which is achieved by periodically conducted retraining, including the assimilation of new occupations. And for many persons it is important for the vocational instruction to be combined with general-educational instruction.

In order to retain the earning capacity and able-bodied condition of the persons in middle age in those instances when the working conditions are unfavorable, a factor of vital importance is the development of new technological processes, the introduction of robotics. With normal working conditions it is important to strive to increase the efficiency of the working and recreational modes, to increase the beneficial return, and to reduce the losses of work time. Special attention must be devoted to those branches and sectors where the danger of on-the-job accidents is the greatest.

For the greater part of the population in this sex and age group, namely for women with young children, a question that arises with a rather great degree of acuity is the question of eliminating the mental stresses that are linked with the bringing up of children and the running of the household. What resolutions can be suggested here? First of all, it is important to continue the line aimed at developing the services sphere and at systematizing the operating schedules for the institutions in that sphere, and to make wider use of flexible forms of employment.

A special place in developing our country's labor potential is occupied by the age group of the able-bodied population 50 years or older. They are the generation of those who were born during the years of a high birth rate, a

generation that experienced the war as children, and that did not take part in military actions. The level of employment for this age group drops to a rather considerable degree as compared with the previous group of population, and one cannot give a positive evaluation to this from the point of view of the use of the labor potential.

What, then, are the typical features of the labor participation of people older than 50 years? How has the development of the national economy during recent years influenced the structure of employment of the able-bodied population? The entire period after the 1960's was characterized by a considerable increase in the spheres of application of labor for persons of all ages. Scientific-technical progress has led to a considerable easing of the working conditions in many types of operations, and this has expanded the capabilities of the persons in the older age groups to participate in social production by using their knowledge and occupational experience. There has been an increase in their share among the workers employed in industry, construction, transportation, and communication.

For workers older than 50 years the branches that are of great interest from the point of view of being the sphere of the application of their labor are the branches of cultural and social-and-everyday services. The development of these branches, especially since the 1950's, occurred at rapid rates. There was an increase in the number of operations that correspond to the requirements of a considerable segment of the persons in the older age groups with regard to the working conditions and work schedules. At the present time, in the branches of the services sphere, there is a need both for skilled labor and unskilled labor.

Although the attention to questions of easing the working conditions is not being reduced, among workers in the older age groups at the present time one still observes their departure from social production before the advent of the officially established age for retirement on the basis of age, and this is specifically related to the working conditions. In 1982 the number of pensions granted on privileged conditions was almost 3 times greater than in 1972. Persons of preretirement age do not always succeed in changing their type of activity for one that is more acceptable for their years with regard to working conditions. There is insufficient information about those occupations where one can use the experience and knowledge that were obtained during the person's previous labor life. But this is not the only reason that explains the fact that the level of their employment in social production is lower than that of other age groups. Workers older than 50 years in a number of instances need to have their work schedule changed. Public job-location agencies could facilitate this change.

It is already customary to take a double approach to the employment of persons who have retired on age: both from the position of having an additional source of manpower, and from the position of preserving a definite amount of vital tone in elderly people. Labor that is up to their physical capability and participation in social life help people of retirement age to preserve an active, long life.

For that segment of retirees who want to change their type of occupational activity, we must develop the recommendations for the most desirable change of their labor. But for the time being, with the aid of retirees, the attempt is being made chiefly to "fill the breaches," namely, to use their labor in relatively unskilled, so-called nonprestigious operations, attracting them by using all kinds of legal, and sometimes also completely illegal, benefits and additional payments.

In the long-term view this "path" is completely unacceptable, not only because the percentage of highly educated and qualified persons among the population of older able-bodied age will continue to grow, but also because of the forthcoming sharp increase in the share of women. And, has been indicated by practical experience, women who have retired agree less frequently to accept unprestigious, relatively unskilled work.

One must not discount the circumstance that the number of persons in the group being considered will increase in the city only. As a result, by the year 2000 the percentage of the urban population in the overall population that is older than able-bodied age will increase significantly. This will reduce the contingents of retirees having a low level of education.

For the individual republics, the highest share of persons older than able-bodied age in the long-term view will apparently be in the industrially developed republics where the population has a higher level of occupational training. That means that by the year 2000 there will be a strong rise in the educational level of retirees, especially during the first five years after they have attained retirement age. Whereas for the 1979 population census among men in the first five retirement years approximately 56 percent had had primary education or less, by the year 2000 the share of those persons will be significantly reduced. There will also be a reduction in the share of women with primary education or less.

Research conducted by NIEI indicates that the measures to attract retirees to unskilled work (simultaneous payment of pensions and wages) have been having a smaller and smaller effect, although the funds for those purposes which are being expended are considerable.

During the years of the 11th Five-Year Plan, after the adoption of additional measures to attract retirees into the national economy, the rates of increase in the number of employed retirees, according to data provided by USSR TsSU [Central Statistics Administration], increased insignificantly. To a certain degree that was linked with the fact that there had been a change in the makeup of the retirees (with regard to education, proficiency level, work experience), and, in addition, fewer and fewer people were being attracted by unskilled work, although substantial material benefits had been stipulated specifically for those types of labor. At the same time, a problem that has been an increasingly frequent and acute one is the problem of finding jobs for retirees with a high level of education and special training. They want to continue to work in their field of activity, but, naturally, with a smaller work load, because one certainly cannot offer a research engineer a job as a storeroom attendant! Therefore we must immediately consider the more

efficient use of the labor potential of workers with a high level of proficiency.

Where and how do we use the labor of those retirees who want to work? Under what conditions?

A guidepost in this regard can be provided by those major changes that have occurred in the distribution of persons older than the able-bodied age during the past 20 years (1959-1979, according to materials provided by the population census) by branches of the national economy and by occupations. They reflect the tendencies in the change of the aims in life of the population of retirement age. Under the influence of the rise in the standard of living and the rise of the educational and proficiency level, there has been a reduction of the self-interest that retirees have in work that involves physical labor. During the period that was indicated, there was a reduction in the absolute number and the percentage of retirees employed in physical labor. For example, whereas in 1959 the share of persons who had been retired on age and who were then reemployed in physical labor was 93 percent, in 1979 that figure was already 72 percent.

A larger and larger number of people older than able-bodied age are concentrated in the branches of the services sphere. According to the data in the 1979 population census, more than 47 percent of all the people in this age group are working in branches of the services sphere, whereas in 1959 approximately 16 percent of them were employed there. During that 20-year period the highest growth rates for the number of employed retirees were in science, administration, public health, and education. In the branches of material production, the reduction in the growth rate for employed retirees was observed in industry and agriculture.

As for the type of occupation, persons older than able-bodied age are typified by a definite polarization depending upon the level of their education and proficiency. The concentration of people of older ages in jobs as scientific workers, as well as physicians and instructors at institutions of higher learning, is justified and completely reasonable, since those occupations pertain to mental labor that requires the highest level of proficiency and that makes high demands not only of the person's educational level, but also his practical experience as a worker in that area. In our opinion, this tendency will continue to pertain in the long-term view.

But among these occupations there are positions for administrators which do not require higher training (at an institution of higher learning) on the part of the workers (for example, heads of procurement or supply organizations, chiefs of administrative departments, building managers, etc.). The average level of education for these categories of workers varies from 9.7 to 11.3 years, which corresponds to training equivalent to secondary school or a technicum. It should be noted that this group of occupations is not distinguished by a high degree of attractiveness for young people, and therefore there exists a real possibility with the next ten years or so to use retirees here. In the more remote future, as one observes a rise in the organizational-technical level of the sphere of administration, supply, and services, and a rise in the level of requirements for the proficiency level in

those categories of workers, it will apparently become possible to make wider use of younger specialists here.

Experience shows us that the use of the labor performed by persons who have retired on age is most efficient in their immediate area of specialization, of course, if they continue to conform to the requirements that are made of them with regard to the type of work and the position being filled. It is acceptable to change the work schedule in the event of a partial loss of the person's able-bodied condition. But the use of the labor of retirees who have left the sphere of mental labor and are assigned to unskilled simple operations, to a certain degree, lessens the need for the mechanization and automation of the labor processes, reduces the acuity of the problem, and in addition leads to the underuse of the retirees' capabilities and experience. But for the time being there are still many people of retirement age who are employed in simple labor, in work that requires only a low level of proficiency and that is unprestigious. The 1979 census indicates that 40 percent of the persons who retired on age were concentrated in operations requiring a low level of proficiency, where 10 percent of the total number of workers in physical labor were employed. Basically this is unskilled labor in the services sphere (coatroom attendants, janitors, cleaning personnel, watchmen, guards, bottle washers) and a number of agricultural occupations (grooms, swineherds, subsidiary workers in animal husbandry). It should be noted that during the past ten years the number of persons of older ages in these occupations, practically speaking, has not increased. In the long-term view the rise in the population's standard of living and its educational level, practically speaking, will lead to a reduction of the contingent of those who will have as their basic activity the occupation of unskilled labor. For persons of retirement age, a greater and greater incentive to work will be not only the need to earn additional wages, but also their desire to apply their accumulated knowledge and occupational experience, to continue their favorite activity, to communicate with their comrades, and to share their intellectual knowledge with young people.

However, it must be noted that the factors that continue to be the chief motivating ones for a considerable number of middle-link workers (cashiers, file clerks, middle-level medical personnel, etc.) are the material ones. The wages paid to those workers are lower than in other categories, and, consequently, the pension is also smaller, and this causes the need for additional wages. Apparently we can continue to rely on retirees to perform these types of work.

Having dwelt briefly on the peculiarities of the employment rate of various socio-demographical groups of the population in social production, we would like to direct attention to the need for taking a differentiated, comprehensive approach when resolving questions of guaranteeing the more efficient use of society's overall labor potential.

COPYRIGHT: "Sotsialisticheskiy trud", Izdatel'stvo "Transport", 1984.

5075

CSO: 1848/43

LABOR

WORK INCENTIVES IN TECHNICAL PROFESSIONS EXAMINED

Moscow SOTSIALISTICHESKIY TRUD in Russian No 7, Jul 84 pp 62-71

[Article by V. Kharin, chief of the Scientific, Construction and Design Organizations Control Apparatus Department, USSR Goskomtrud [State Committee for Labor and Social Problems], under rubric "Scientific-Technical Progress and Labor": "Incentives for Acceleration"]

[Text] Within the next few years our industry will have to guarantee the sharp increase in the share of output which has indicators corresponding to the best present-day models, and the introduction of new progressive technological processes. On that basis there must be a substantial increase in labor productivity. That is the task that was advanced by the CPSU Central Committee and the USSR Council of Ministers in the decree "Measures for Accelerating Scientific-Technical Progress in the National Economy."

An important condition for developing and assimilating technology and technological schemes that are capable of competing with the best foreign models is the improvement of the payment for the labor performed by scientists, designers, technologists, planners, and other engineer-technical workers. The decree that was mentioned has increased the lump-sum bonuses to be paid from centralized funds of ministries and departments for the most important research and development and the assimilation of their results in production. There has been a complete elimination of the previously existing limitations in the sizes of the bonuses paid to persons who have developed those types of equipment, technological schemes, and materials which, with regard to the most important indicators, correspond to the worldwide technical-economic level or surpass it. Provision has been made for an increase in the markups added to the wholesale prices for the most effective output that has parameters as good as the best domestic and foreign models, and for the greater rigidity of the sanctions applied for the production of obsolete articles. Authorization has been given for taking some of the money in the incentive funds which are formed as a result of the reduction of the production costs and transferring it to other enterprises and organizations irrespective of the department to which they belong, when there is joint fulfillment of nationwide scientific-technical programs.

There has been an increase in the responsibility borne by the administrative workers at the production associations and enterprises for the fulfillment of

the plans for the assimilation of new technology and the introduction of progressive technological schemes and for the production of obsolete output. In the event of nonfulfillment of the plans and assignments for new technology, the sizes of the bonuses for the basic results of the economic activity are reduced by no less than 25 percent.

Payment of Labor Depending Upon the Quality of Plans and Developments

As has been shown by life, the automatic increase in the salary rates of scientific workers when they have been awarded a academic degree, and also when they have reached a specific work longevity, does not contribute to the increase in the rate of results of their activity or to a reduction of the periods of time required to assimilate the achievements of science and technology. The payment of labor performed by designers, technologists, planners, and other specialists is insufficiently tied in with the quality of the developments and the design resolutions, or with the technical level of the output being produced. We have not seen the elimination of the equalization policy in the payment of the wages of the highly qualified specialists who are developing machinery, equipment, instruments, and materials that correspond to the highest worldwide level, and the workers who are engaged in the partial modernization of obsolete technology and technological schemes. We have noted a tendency toward the reduction in the prestige attached to engineer labor, primarily that of the designer, technologist, or planner. In a number of branches of the national economy, including machine building, the level of the average wages paid to the workers has become higher than that for the engineer-technical workers.

The most acute shortcomings in the payment of the labor performed by workers in the sphere of scientific research and development, in our opinion, can be eliminated within the next few years without waiting for a fundamental reorganization of the rate system or the allocation for that purpose of large amounts of money from the state budget. For these purposes it is necessary to resolve first of all the following tasks. First, the guaranteeing of a real dependence between the technical level and the amounts of time needed to renew the output and the sizes of the wages paid to the scientists, designers, technologists, planners, researchers, and other categories of workers whose labor has decisive importance for the development of science and technology. Secondly, the intensification of the differentiation in the payment of their labor, with a consideration of the personal contribution made by each of them to the creation and assimilation of the highly effective technology and technological scheme. Thirdly, the providing of their self-interest in the efficient use of the labor, material, and financial resources.

The reorganization of the system of paying for the labor in these areas will have the greatest benefit if it is carried out only at the expense of the inner resources of the institutions and organizations: the reinforcement of the discipline and responsibility in the work, and the elimination of the unproductive expenditures of labor which frequently amount to as much as half the total worktime fund.

At the present time a number of important experiments are under way to improve the providing of incentives for scientific-technical progress, which

experiments are contributing to a noticeable acceleration of its rates. With a consideration of the preliminary results, for the further improvement of the payment of labor it is necessary first of all to intensify the influence that the rate system has upon the qualitative level of the research and development.

It is necessary to keep in mind that at the present time the payment on the basis of the rate constitutes approximately nine-tenths of the total earnings of the scientific workers. That payment must become more flexible, especially as this pertains to the salary rates of the most highly qualified specialists, including persons having an academic degree. The time has come to reject once and for all the automatic increase of salary rates when a person has been awarded a academic degree or has increased his scientific-pedagogical longevity, and simultaneously to increase substantially the salary paid to the scientists who develop highly effective technology and technological schemes.

In the future, until the introduction of new rate conditions, the prestige level of the labor performed by designers, technologists, planners, and engineers can be substantially raised if one raises the maximum level of the salary rates for those workers, which provide for the creation of new technology, technological schemes, and plans that correspond to the highest worldwide level. The self-interest that the administrative workers, highly skilled specialists, and workers at the enterprises in machine building have in assimilating the production of new technology should be intensified primarily at the test and experimental production entities, shops, and sectors.

Much can be done to intensify the incentive effect of the system of bonus payments for the effectiveness of technology and technological schemes that are newly created and being assimilated in production, and for reinforcing the responsibility borne by the workers, correlating more closely the payment of their labor with the final results. Another question that deserves attention is the question of expanding the guarantees given to the enterprises and organizations that are assimilating the production of new, highly effective technology, to protect them against the unsubstantiated reduction of the funds being expended for the payment of labor.

An analysis of the practice of providing incentives for persons who develop new technology and technological schemes, depending upon the actual economic benefit resulting from their introduction, indicates that an increase in payments from the material incentives fund does not resolve all the problems of incentive payments. The most important problem is the fact that the obtaining of the benefit and the payment of the labor are considerably remote from one another in time. An increase in the share of the bonuses that are paid out as an advance does very little to mollify the negative effect of this situation. Therefore it would seem to be promising to divide the variable part of the earnings of the workers in the scientific sphere into two shares: that which is to be paid depending upon the effectiveness of the labor during a definite period of time (month, quarter, half-year, etc.), and payment on the basis of the results of the job that has been completed, handed over to the customer, and assimilated in production.

The variable part of the earnings in the scientific sphere can form not only as a result of the money transferred to the material incentive fund, but also as a result of the rate part of the payment of labor, by means of reserving for these purposes a share of the wage fund. In our opinion, the bulk of the reserved amounts of money for the wage fund must be intended to provide incentives for high creative participation by the scientists, designers, planners, and other persons who are developing new technology and technological schemes on the basis of current results and should be paid, as a rule, every month. What is required is a system of regular evaluation -- tied in with the expected final results -- of the effectiveness of the labor in the institutions and organizations in the scientific sphere. In addition, the evaluation of the activity of each worker must be made dependent upon the activity of the scientific, design, technological, or planning organization as a whole and its individual subdivisions, and must take into consideration not only the topics that have been fulfilled, but also the worker's plans for the future, the scientific backlog that he has, and the growth of his creative potential.

For the successful resolution of this task it is necessary to carry out the appropriate reorganization of the procedure for the certification of scientists, designers, technologists, planners, and researchers. As is well known, the certification statute that was approved in 1969 by GKNT [State Committee for Science and Technology] and USSR Gosstroy contains only a general requirement: the evaluation of the labor must be objective. It does not indicate the criteria or the procedure for conducting that evaluation. The authors of the statute, in all probability, saw their basic task in defining the correspondence between the worker and the position occupied by him, and in providing guarantees against his being unjustly fired.

Scientific-technical activity is extremely varied. It encompasses many branches of the national economy that have their own peculiarities, and the people in the most varied occupations participate in it. Therefore, in our opinion, the attempts to establish a general-purpose methodology cannot be crowned by success. For example, there have been unsuccessful attempts to evaluate in points and to reduce to a single denominator all the indicators that characterize the labor and social activity of workers in science. It would be desirable to develop and to reflect in the certification statute, first of all, uniform principles and a uniform procedure for evaluating the labor of scientists, designers, technologists, planners, and researchers, which could be employed with a consideration of the specific aspects of the various types of activity.

The new statute should provide, first of all, for such criteria of the effectiveness of labor as the innovation and importance of the research and development that were completed with the participation of the particular level, their scientific-technical level and the extent of the economic benefit, the future prospects of the programs that have been prepared, and the observance of the established labor norms and the deadlines for the completion of the projects and the introduction of them into production. It would be desirable also to reflect in them the procedure for taking into consideration

the result rate of the labor, so that it would be possible to compare the obtained results with expenditures of labor, material, and financial resources.

On the basis of the results of the certification, obviously, it is necessary not only to raise, but also to lower, within the limits of the established minimum and maximum amounts, the salary rates for scientists, designers, technologists, planners, and other specialists. It is also desirable to use, in the practical situation, the opportunity to form creative collectives on the basis of the conclusion of labor contracts that are tied in with the planned deadlines for the specific research project or development and with the evaluation of the effectiveness of the labor.

Improving the Establishment of Labor Norms and the Use of the Wage Fund

At the present level of development of the economy it is necessary to establish, for every worker in the sphere of research and development, specific production assignments, the fulfillment and overfulfillment of which would serve as the gauge of his labor contribution to the overall results of the collective's activity. In this regard a factor of great importance is the improvement of the establishment of labor norms for workers at NII [scientific-research institutes] and KB [design bureaus], and technological-planning organizations. At the present time we have available: the Standard Time Norms for the Development of Designer Documentation, which were approved by decree of USSR Goskomtrud [State Committee for Labor and Social Problems] and AUCTTU, dated 13 May 1982; Uniform Time Norms and Rates for Design and Research Projects, which were approved by decree of USSR Gosstroy, USSR Goskomtrud and AUCCTU, dated 30 November 1978; the Standard Time Norms for the Programming of Tasks of Electronic Computers, which were approved by decree of Goskomtrud and AUCCTU, dated 28 May 1980; and a number of other norms for labor expenditures which were developed in a centralized procedure. A list of such norms that are recommended for use, as of 1 January 1983, was published by the Central Bureau of Labor Norms, of NII of Labor. In addition, many ministries use departmental norms governing the labor-intensity of scientific-technical projects. Positive experience of issuing assignments to workers on the basis of the norms has been accumulated at the design organizations of Minstankoprom [Ministry of the Machine Tool and Tool Building Industry], Mintyazhmash [Ministry of Heavy and Transport Machine Building], and other machine building ministries. Gidroyekt Institute of USSR Minenergo [Ministry of Power and Electrification] employed an automated system for accounting for and planning the labor expenditures for the design and research projects. Something that is becoming more and more widespread is the use of the norms pertaining to the labor-intensity for scientific-research developments.

The most complicated matter is the introduction of the establishment of norms in scientific-research organizations. This is explained first of all by the variety of the operations to be fulfilled. Nevertheless the scope of the operations and occupations for which labor norms can be introduced at those organizations can be considerably expanded.

On the basis of the norms that have been approved in a centralized procedure, according to our computations, at the present time norms can already be established for 80-90 percent of the persons working in planning, research, and design organizations and as much as 30-50 percent of the associates in scientific-research institutions. However, the results of a one-time study attest to the fact that even the existing base for improving the establishment of labor norms in the sphere of research and development is being used poorly. For example, in planning organizations the uniform and standard time norms were used for only 11 percent of the workers; in design organizations, 7 percent; and scientific-research organizations, 5 percent. One of the essential reasons why their broad introduction has been restrained is, in our opinion, the practice of planning the wage fund of the scientific-research institutions, and the design, technological, planning, and research organizations on the basis of the authorized-personnel number, with absolutely no consideration of the actual labor-intensity of the operations.

The improvement of the establishment of labor norms helps to accelerate the carrying out of a number of principles that have revealed themselves and proven their worth in the course of experiments, principles that guarantee the improvement of the planning and use of the wage fund, with the simultaneous expansion of the rights of the scientific-technical organizations when establishing the salary rates and the conditions for the payment of bonuses with a consideration of the effectiveness of the labor performed by each worker. For example, our press has already mentioned several times the positive effect exerted upon the results of the activity of 67 scientific collectives throughout the country by the new system of payment of labor that was first introduced in 1969 at the Physical Chemistry Institute imeni L. Ya. Karpov, the essence of which consists in the rejection of the mechanical raising of the salary rates of scientific workers when they are awarded a learned degree with a consideration of their longevity in scientific-pedagogical work, and when establishing their amounts on the basis of an evaluation of the results of their labor.

The introduction of norms for labor expenditures will contribute to the broader application of methods of target-program administration, systems for automatic planning, and new instruments, and will create favorable conditions for raising the qualitative level of the activity in the scientific sphere while reducing the number of workers.

For the better consideration of the individual differences in the quantity and quality of the labor contributed to the development of scientific-technical progress, in addition to improving the establishment of norms it would be desirable as rapidly as possible to expand the existing framework of the rate system. This is also attested to by the first results of the experiment being carried out in the scientific, design, and technological subdivisions of six production associations in Leningrad (Zaytsev, N. "The Leningrad Experiment," SOTSIALISTICHESKIY TRUD, No 8, 1983, pp 35-38; Amonskiy, N., Stepanov, A., "The Leningrad Experiment: First Results," SOTSIALISTICHESKIY TRUD, No 4, 1984, pp 82-85).

As in the NII imeni L. Ya. Karpov, the basic condition for this experiment is the expansion of the rights of the scientific collective when establishing the amounts of the wages paid to the workers in the scientific, design, and technological services of production associations within the limits of the wage funds allocated to them. The carrying out of measures to raise the technical level and improve the quality of the developments, and to increase the productivity of labor, guarantees the freeing of some of the workers, with a corresponding saving of funds for the payment of labor. Under the conditions of the experiment, they can be channeled into the raising of the salary rates for the technologists to the level of the salaries of designers in the corresponding categories, and toward increasing the salaries paid to scientists, designers, and technologists within the limits of the existing system without observing the so-called "average" wages.

Association administrators have been granted the right to promote workers without taking the established norms into consideration, to introduce pay differentials to be added onto the salaries for a definite period of time with a consideration of the personal contribution that has been made to technical progress, and to employ more progressive systems of wages.

In the course of the experiment it was possible to reveal and to put into action substantial reserves for increasing the effectiveness of the labor performed by scientists, designers, and technologists. During the first six months alone while it was being carried out, chiefly on the basis of improving the organization of labor and the establishment of labor norms, more than 7 percent of the table-of-organization number of workers of the organizations and subdivisions that were taking part in it were freed for other assignment.

It is typical that the saving of the wage fund, as a rule, was not expended for the establishment of permanent pay differentials added to the salaries for high level of proficiency. The saving was used chiefly to increase the specialist's earnings, depending upon the result rate of his labor. Pay differentials are authorized for periods of one to three months or for the planned period of the fulfillment of very important projects. This has an encouraging effect upon increasing the effectiveness of the research and development. At the same time one cannot fail to note that under such conditions the pay differentials added onto the salaries, from the point of view of their functions, become more and more similar to added wages for piecework and to bonuses.

Apparently in the future, as experience is accumulated, the Leningrad associations will also find new forms of intensifying the dependence between the wages paid to researchers and developers and the technical level of the output being produced by them. This search is already under way, and it is linked basically with the introduction in the subdivisions of the principles of cost accountability and the gradual transition to collective systems of paying for labor on the basis of the final results of the work.

The basis of these systems can be a series of planning and labor norms that provide for the formation of the wage fund and the material incentive fund depending upon the labor-intensity and effectiveness of the research,

development, and plans. In addition, the overall size of the wage fund and the material incentive fund will be made dependent upon the meaningfulness and social utility of the projects. If the developer does not achieve the planned results, he repays those amounts of money that were overpaid to him, and if the result exceeds the expectations, he receives the right to an increase in compensation.

The introduction of this procedure of planning the use of funds would intensify the incentives for an economic competition among the subdivisions, and subsequently among scientific-technical organizations too. Because the funds to provide incentives for the effectively operating subdivisions and organizations can be substantially increased by eliminating petty topics and the duplication in the topical plans, by reducing periods of time required to carry out and introduce the research and development, and by eliminating excessive scientific, design, and other links in the "research to production" cycle. The economizing of the wage fund for every topic that has been introduced with the achievement of the planned effect, as well as a certain part of the saving with regard to other expenditure items can become an important source for providing incentives to the workers in the scientific sphere.

Distribution of Earnings Among the Executors

When the transition is made to the planning and financing of scientific-technical activity based on norms, there is an intensification of the incentive role of all the wage elements and the incentive payments made to the workers increase in proportion to the actual increase in the result rate of their labor. On the basis of the norms, the executors must be informed of the assignments with regard to the basic technical-economic indicators which must be achieved, and also with regard to the labor-intensity of the projects and the total amount of expenditures to carry them out. They are also aware of the total sum of the wages and bonuses for attaining and surpassing the planned results and the size of the sanctions levied as a result of the unsatisfactory scientific-technical level of the completed research, development, and plans. All this fundamentally changes their attitude to the project, inasmuch as a considerable amount of the funds for the payment of labor is paid out only after obtaining the planned effect in production. The distribution of the earnings among the individual executors in this instance becomes a matter for the labor collective, which is capable of taking into consideration the creative participation of each person in the resolution of the assigned tasks, the importance and complexity of the projects, and other factors that characterize the personal labor contribution to the overall results of the scientific-technical activity. A system of payment with which the worker's earnings are formed with a consideration both of the intermediate and the final results of his labor is already undergoing experimental verification in two technological-design organizations in Moscow and in one design organization in Ulyanovsk.

The preliminary results of the experiment with the Ulyanovsk Special Design Bureau of Heavy Milling Machines (SKB [Special Design Bureau]) indicate that the successful application of this system requires careful preparation and primarily the creation of a norm base. In addition, it is necessary to have a

fundamental reorganization of the organization and discipline of labor, and the planning of the scientific-technical subject matter and the financing of the projects both on the part of the superior agencies of administration, and within the KB [design bureau] itself.

In the process of preparing for the introduction of the system of paying for labor on the basis of the final results of the project, the Ulyanovsk SKB has introduced a new system of administration, which provides for the formation -- in addition to large-scale design and research subdivisions that have been specialized by types of machine tools -- of functional departments (by types of operations that are common to all types of machine tools) and sections (brigades) for the development of the plan for an individual machine tool. For each plan, proceeding from the Standard Time Norms for the Development of Designer Documentation, which were approved by USSR Goskomtrud and AUCCTU, as well as the consolidated time norms for the establishment of norms for designer operations, which were established by Minstankoprom, provision is made for normative labor-intensity and the total cost, with the isolation of the expenditures for wages.

Simultaneously with the improvement of the establishment of norms for labor, there has been a refinement of the basic directions in the development of machine tools, the albums of standards have been corrected, mechanized drafting of parts has been employed, and they have been standardized with the aid of EBM [electronic computer]. A number of other measures have been carried out to raise the technical level of the plans and to reduce their labor-intensity.

On the basis of the steps that were taken, the administrators of the Ulyanovsk SKB were given the opportunity to issue to each section (brigade) a production assignment that indicated the basic technical-economic indicators that had to be achieved, the normative labor-intensity of the plan, the planned deadline for turning it over and for manufacturing the experimental model (series), as well as the total amount of the basic wages and the size of the bonuses, proceeding from the planned effectiveness of the new machine tool.

the evaluation of the technical level of the plan and the final settlement with the sector (brigade) with regard to wages are carried out after the plan has been turned over to the customer, who accepts it only after manufacturing the experimental model (series). All the corrections to be made at the request of the customer as a result of designer or technological shortcomings are made without any additional payment. The wages prior to the turning over of the plan are computed for the section (brigade) in the form of advance payment, for which 80 to 90 percent of the basic wages according to the production assignment is expended. The total amount of the bonuses and the reserved part of the basic wages are not paid until after the plan has been turned over.

If the designer collective makes suggestions for reducing the normative labor-intensity of the plan, the production assignment is refined. In this instance the monthly advance can be increased in conformity with the level of reduction of the labor-intensity, provided that the pledges that have been taken by the collective and the rigid work schedule that has been drawn up on their basis

are being successfully fulfilled. At such time an increased individual assignment is established for each designer.

If the schedule is fulfilled and the rated size of the personnel for the section (brigade) has not been exceeded, the worker is guaranteed earnings in the amount of the established salary (with a consideration of the amount of time that has been worked). But if the worker is not coping with the individual-output norms, is producing defective output, or creates idle-time situations, the payment for his labor is reduced.

The collective additional payment for piecework, which is formed as a result of the reduction of the normative labor-intensity of the plan, is distributed on the basis of coefficients of labor participation. The size of those coefficients is computed on the basis of the individual labor productivity, the quality of the operations fulfilled, the technical level of the recommended designer resolutions (with a consideration of their influence upon economic effectiveness, their ability to compete on the foreign market, the metal-intensity of the machine tool, etc.). The KTU [coefficient of labor participation] is established every month by the section (brigade) council within the limits of 0 to 2. When the coefficient is 0, the worker does not participate in the distribution of the additional payment; with coefficient of 1, he receives an incentive payment in the average amount. If the coefficient is more than 1, the earnings increase correspondingly, but they cannot be more than doubled, since the maximum coefficient is equal to 2.

Thus, the earnings of a designer who has been working conscientiously consists of the permanent part -- his salary -- and two variable parts: additional payment for piecework, to be distributed every month, and an incentive payment to be received after the plan has been turned over to the customer. This guarantees that the earnings are linked both with the final results and the intermediate results of the project, with an obvious priority of the worker's self-interest in the high quality of the entire plan as a whole. This system of providing incentives increases the interest that that workers at the KB have in improving all the basic work indicators.

The economic effectiveness of the plans for the new machine tools which have been fulfilled by the collective at the Ulyanovsk SKB during the period of the experiment almost doubled, and constitutes approximately 4 rubles for each ruble expended. The duration of the development of new models of special-purpose heavy machine tools was reduced to 1-2 years. They are exported to 35 countries throughout the world, including the economically developed countries. The share of the output with the highest category of quality at the plant that produces machine tools as designed by the Ulyanovsk GSKB [State Special Design Bureau] has exceeded 60 percent. These designs are typified by a fundamental innovation -- during the experiment the collective at the SKB was issued more than 70 originator's certificates [Soviet patents] for inventions. The labor productivity of the designers during 1980-1982 alone increased by 27 percent, and their average wages, by 26.5 percent. The most highly skilled specialists have earnings as high as 300-350 rubles a month, and this has largely contributed to raising the technical level and improving the quality of the plans.

Developing the Principles of Cost Accountability

Under present-day conditions, when the scientific sphere employs more than 5 million workers and the expenditures for the conducting of research and development exceed 26 billion rubles a year, the problems of the efficient use of resources take on special importance. The time has come to resolve the constantly growing and increasingly complicated tasks in this sphere, primarily by intensifying the activity of the scientific institutions and the designer, technological, planning, and research organizations. The intensive development of science and technology requires -- in addition to the improvement of the cost-accountability interrelations with the production sphere -- the creation and reinforcement of internal cost accountability in those institutions and organizations.

An item of interest is the experience in the use of elements of cost accountability in the collective of the Kharkov Scientific-Research Institute of Basic Chemistry. All its scientific subdivisions are informed not only of the assignments in the subject-matter plan, but also the specific list and volume of the projects to be handed over to the customer in each quarter; the indicators of the scientific-technical level of the completed developments; the annual economic benefit resulting from their introduction; an estimate of the expenditures, subdivided by elements of expenditures; as well as the amounts of money to be used to pay out bonuses and awards based on the year's results.

The institute regularly conducts certification sessions for the subdivisions, during which consideration is taken of the fulfillment of the assignments that are linked with internal cost accountability. On the basis of this certification session, decisions are made concerning the payment of additional incentives to the collective in the subdivision, the further development of the promising projects and the cessation of the fruitless ones, and also concerning the elimination of the ineffectively operating departments, sections, and laboratories. The funds intended for the payment of bonuses to the workers in the subdivision are increased depending upon an increase in the economic effectiveness and the indicators of the technical level of its developments as compared with the planned indicators, and also depending upon the reduction of expenditures as compared with the [established financial] limits.

Internal cost accountability guarantees that the payment of bonuses to each worker at the institute is interrelated with the evaluation of the activity of the collective as a whole, the structural subdivision, and that worker personally, and this links the payment of labor more closely with its real results. This has promoted a considerable increase in the economic effectiveness of the operations, with a reduction in the number of personnel.

Unfortunately, GKNT, USSR Academy of Sciences, and many ministries are not yet paying the proper attention to this extremely complicated and painstaking, but very important and necessary work, or to the generalization and dissemination of the advanced experience.

Genuine cost accountability in the research and development sphere, in our opinion, can be constructed on the basis of the allocation of the financial, material, and labor resources not for the institution or organization as a whole, but only for the purpose of achieving a specific result (the economic benefit). One can use various time-tested forms of credit interrelationships with the customers, including the ministries and departments, industrial associations, and other superior organizations.

For this reorganization it is necessary to carry out the following measures:

- when preparing and considering the topic plans of the estimates for each topic must be drawn up with an isolation of the expenditure of funds for the payment of labor and the acquisition of equipment and materials;

- on the part of the superior organization, in addition to the topics, it is necessary to consider and approve the total amount of expenses for each topic or stage of it, including for wages, and also to consider and approve the normative labor-intensity of the operations;

- when sending to the reference-information collection the reports on completed projects, it is necessary also to submit reports on actual costs and the expenditures made by the individual items of expenditures;

- in the event of nonfulfillment of a project, it is necessary to reduce correspondingly for the organization the financial, labor, and material resources to be allocated, including the money in the economic incentive funds;

- in the event of noncompensation of a loss that has been inflicted, it is necessary to consider the question of the disbanding of a subdivision that has been operating unsatisfactorily, or the organization as a whole;

- it is necessary to extract from the customers of research and development which have not been introduced within three years after the moment of their completion the cost of those projects, for payment to the state budget.

An important condition for the intensification of the cost-accountability principles in the sphere of scientific research and development is the introduction of the regular and purposeful evaluation of the activity of the labor collectives in the field of scientific-technical progress. It is necessary to carry out a regular study not only of the effectiveness of the labor performed by individual researchers, developers, and subdivisions. It is also necessary to evaluate the extent to which the activity of the collectives at the scientific institutions, and design, technological, and planning organizations is directed at the attainment of the world's highest level with regard to the most important technical-economic indicators for the output being produced.

The application of the appropriate indicators would make it possible to intensify the effect of the entire system of wages upon the rates of scientific-technical progress. A study of the practice of the formation of

the funds for the providing of material incentives and the payment of bonuses for operations involving new technology, depending upon the real economic effectiveness of those operations, which practice was accumulated during 1980-1983, attests to the intensification of its desirable effect upon the development of scientific-technical progress. There has been a reinforcement of the relationship between the size of the incentive payment and the results of the use of the achievements of science and technology in production, and an increase in the size of the incentive payments, especially by means of markups added onto the prices of new, highly-effective output. For example, in the scientific-research institutions and design and technological organizations of Minneftekhimprom [Ministry of Petroleum Refining and Petrochemical Industry] the share of the bonuses paid from the material incentive fund during 1981-1982 increased by a factor of more than 1.5.

The statutes that were approved at NII and KB for the paying of bonuses are being oriented to an increasingly large degree upon the payment of bonuses in increased amounts to workers who guarantee the development of new technology and technological schemes which have properties that correspond to the worldwide level or surpass it. For example, at the Moscow NII of Organic Semifinished Products and Dyes, the bulk of the money in the material incentive fund is intended for the payment of bonuses for fundamental new technical resolutions. When a project is fulfilled at the level of an invention, the bonuses are paid in increased amounts. In collectives that have fulfilled important assignments, the amounts of the incentive payment are frequently 2-3 times higher than the average for the institute.

However, the work that has been begun for reorganizing the system of paying bonuses for new technology is not yet complete and has a number of substantial shortcomings. The chief one consists in the fact that, for the time being, little use is being made of incentive payments for fundamentally new technical resolutions that make it possible to bring the quality of the output being produced up to the world level. It is necessary to provide better incentives also for the use of inventions.

It is probably necessary to have a preferential procedure for encouraging developments that open up new directions in the technology and technological processes of production. Unfortunately, the present practice of including in the new-technology plans a tremendous quantity of minor projects that are linked with the partial modernization of the equipment and technological schemes that are being employed leads to the dispersal of the funds being channeled into the special systems of providing incentives for the payment of bonuses to innovators.

In the decree adopted by the CPSU Central Committee and the USSR Council of Ministers with regard to the measures for accelerating scientific-technical progress it is indicated that the only technology that can be considered to be new is that which brings our country up to the forefront in the sphere of scientific-technical progress. That means that the funds being channeled into the special additional systems for the providing of bonuses for new technology must be expended chiefly to encourage the development and assimilation in production of fundamentally new, highly effective technology and technological schemes which, from the point of view of all their basic indicators, surpass

the world level. As for the partial modernization of the technology and technological schemes being employed, this must be encouraged to a greater degree by means of the payment of bonuses for the basic results of the work performed by the enterprise, which must be interrelated more closely with the rise in the technical level of production in each work sector.

The creation of advantages in the payment of labor for workers engaged in the development of technology and technological schemes that correspond to the best models on the world market also depends upon the improvement of the procedure for the formation of material incentive funds. It would seem that the time has come for substantially expanding the sources of financing of those funds, primarily by drawing on the profit that is formed as a result of the use of progressive technological processes, and also with a consideration of the economic benefit derived from the new design resolutions when building or remodeling enterprises, etc. Another question that deserves attention is the question of introducing increased norms for their formation during the fulfillment of projects when the technical assignments stipulate the attainment of indicators that surpass the world level. For such projects there must also be a more advantageous procedure for the payment of bonuses in the form of an advance, that is, prior to the obtaining of the planned economic benefit.

In the implementation of decisions made by the party and the government with regard to the acceleration of scientific-technical progress, a large amount of work is being carried out to prepare and to implement economic measures that are aimed at intensifying the self-interest in the raising of the technical level and the improvement of the quality of the output being produced, and in the prompt fulfillment of the plans and assignments for new technology. Those measures will undoubtedly reflect in addition that valuable experience of the advanced scientific, design, technological, planning, and research collectives which has been accumulated by them in the area of the improvement of the payment of labor.

COPYRIGHT: Izdatel'stvo "TRANSPORT", "Sotsialisticheskiy trud", 1984.

5075

CSO: 1828/41

LABOR

EFFICIENCY OF RURAL TRADE PERSONNEL SCRUTINIZED

Moscow SOTSIALISTICHESKIY TRUD in Russian No 7, Jul 84 pp 59-61

[Article by M. Lerner, A. Nevmatulin, K. Akhmetova, and T. Yankovskaya (Karaganda): "How to Determine the Effectiveness of the Labor Performed by Trade Workers in Rural Areas: Methodology for Computing Norms for Personnel Size and for Improving the Incentives Provided"]

[Text] In the trade network in rural areas it has not yet been possible to develop norms for the number of workers. When assigning personnel, as a rule, a consideration is taken of the number of billets in the store, the experience in the advanced enterprises, the peculiarities of the individual populated places, rayons, oblasts, etc. The effectiveness of labor is usually determined by the commodity turnover in rubles per worker. However, this indicator is not devoid of shortcomings, as a result of which it would be desirable to employ another indicator that more completely reflects the labor-intensity of the trade operations.

In our opinion, as applicable to the trade enterprises in rural localities and in small city-type settlements, one can use such an indicator as the number of inhabitants being served per individual trade worker (X_0), reduced to a comparable form. The latter is necessary because, in various populated points, the number and size of the purchases per local inhabitant are dissimilar. This is affected by the influence of such factors as the purchase funds per capita of population, the degree of the use of those funds, and also the number of drive-in customers (in this instance, on the average per 100 local inhabitants), the development of personal and subsidiary plots, national and demographic makeup of the population, etc. In order to guarantee that comparability, it is necessary to employ a correction coefficient (p_{KO}) [Note: Read "p" as Greek "pi"], which reflects the relationship of the sale of the commodities (edible and nonedible, separately) on the average per capita of population in populated point i of type j , on the average for the oblast. By multiplying the number of inhabitants in the populated points of each type by the correction coefficient, we arbitrarily equalize the purchasing capability of an individual inhabitant. This eliminates the influence of the subjective factors upon the level of sale of individual types of commodities in the stores and reveals more completely the differences in the objective conditions of trade in the particular oblast. Thus, $X_0 p_{KO} = Y_0$, that is, the comparable number of inhabitants per trade worker.

At the same time this indicator also makes it possible to lessen the distorting influence of variations in the average price of the commodity unit upon the labor-intensity of its sale, as a result of the fact that the range of those variations is taken within the confines of the average level. The limit of the variations of the average price of the commodity unit is also reduced as a result of the reciprocal elimination of these deviations for individual commodities, since the correlation of the sale on the average per capita of population in populated point i and on the average for the oblast is determined not for the stores specializing in one type of commodity, but for all the edible and nonedible commodities. The greatest amplitude of the variations between the maximum and minimum values of the average price of the commodity unit is typical of the subgroups and individual categories of commodities. It is reduced as one the transition is made to a more consolidated grouping -- to commodity groups, to a series of commodity groups in stores of the Khoztovary [household commodities] and Promtovary [manufactured consumer goods] types, and, finally, to the entire totality of nonedible and edible commodities. Thus, for the Khoztovary stores, in a number of the rayon centers in the random totality that was taken by us, the average price of the commodity unit varied, for six commodity groups, by a factor of 1.5-2; for five, by a factor of 3-4; and for all stores as a whole, by only 1.26. This is explained by the partial reciprocal elimination of the variation of the prices of individual types of commodities.

For the nonfood stores of all types, the variations in the average price of the commodity unit can be analyzed by using as the conventionally in-kind unit for evaluating labor productivity the number of combined purchases being compared. The amplitude of the variations in the average price of the commodity unit as one makes the transition from a less consolidated to a more consolidated grouping of commodities is reduced. This makes it possible to conclude that the indicator of the sale of commodities, on the average per capita of population, for all nonedible (or edible) commodities is subjected much less to the influence of the price factor than the commodity turnover in each store is. This conclusion is of definite significance for developing an evaluational indicator for labor productivity in trade.

In a ranged series of distribution of i type populated points (rayon center, group center, or village) according to indicator Y_0 , it is possible to ascertain the populated point with its greatest value and, on that basis, to compute the degree of relative underuse of the labor resources in the stores in the remaining similar populated points. It is also possible to determine the normative number of trade workers by dividing the compared number of inhabitants in each populated points (that is, the number that has been corrected by correction coefficient p_{k0}) by the highest value of indicator Y_0 .

For nonfood stores in the total number of group centers in the three rayons of Karaganda Oblast, the normative number of workers (computed by proceeding from the achieved highest level of use of labor resources in nonfood stores in the group center of the village of Petrovka) constituted 158 persons, which is 139 persons fewer than their actual size, or 52.6 percent. For food stores (computed on the basis of the achieved highest level of use of labor resources in the food stores of the group center of the village of Sverdlovo) it was

equal to 142 persons, or 94 persons fewer than the actual size (58.8 percent). There is an especially low coefficient of the use of manpower in the stores specializing in "Commodities in Everyday Demand" in ordinary villages, where the normative number of the workers does not exceed 30 percent of the actual number.

When selecting a populated point of this type with the highest level of use of labor resources in trade, it is necessary first to ascertain whether the relatively high labor productivity is not linked with the action of the factor of the "whole-numbered nature" of the workers or by the undermanning of the staff. The preference should be given to that group of advanced stores in each of which no fewer than two salespersons are working. In order to be convinced that in the group of stores in the selected populated point the interrelationship between the labor productivity and the quality of the services provided is of a positive nature, it is necessary to determine the number of persons who gravitate territorially to the particular group center per 100 local inhabitants, and also to determine the similar indicator on the average for the oblast. The coefficient for the interrelationship of these indicators should be compared with the correction coefficient. And if the latter coefficient is smaller than the former, the quality of the services provided in the particular trade center cannot be deemed to be satisfactory.

The proposed methodology for conducting an analysis of the effectiveness of the use of manpower in retail trade with respect to the achieved highest level at the first stage is applicable only in an individually taken oblast. On the republic scale, apparently, it is necessary to take into consideration the different level of labor productivity in the individual branches. Let us assume that in oblast A the coefficient of use of labor resources in the retail trade of the rural rayons constituted 0.4, and in oblast B 0.5. Then those indicators can be compared only after they have been recomputed by proceeding from the correlation between the labor productivity in oblast A and the oblast where it reached the highest level:

$$\frac{Y_i}{Y^{\max}}$$

For example, if in oblast A indicator Y^0 constituted 400 inhabitants per trade worker, in oblast B 300, and $Y^{\max} = 500$, then the coefficients of use of labor resources will be (after recomputation):

$$\text{in oblast } \underline{A}, 0.32 \quad (0.4 \times \frac{400}{500}),$$

$$\text{and in oblast } \underline{B}, 0.3 \quad (0.5 \times \frac{300}{500}).$$

Before this computation it is necessary to guarantee the comparability of the number of inhabitants with regard to their purchasing capability.

A photographic time-motion study that we carried out for studying the work time of salespersons and other personnel in 32 stores confirmed the existence of tremendous reserves for increasing the effectiveness of the use of manpower in trade. For example, more than 27 percent is represented by unregulated departure from work (4.3 percent), the absence of workers because of the violation of the rules governing the operation of the store (2.3 percent), inactivity while customers are present (6.2 percent) and while customers are not present (14.6 percent). For individual stores, these losses of work time are even greater. Despite such tremendous losses of time, advice given to the customers occupies only 0.5 percent in the total balance sheet of the salespersons' workday, and the packages are frequently wrapped by the special packagers.

We also revealed completely unjustified and significant contrasts in the time required to carry out individual labor operations. For example, in produce stores the average expenditures of time for the acceptance of the commodities, the preparing of them for sale, and the restocking of the supplies in the selling area varied, in terms of 100 in-kind units that were sold, from 23 to 112 minutes; for the release of the products and settlement with the customers, from 22 to 70 minutes; and in bread stores, from 17 to 49 minutes. The expenditures of time for the release of commodities and settlement with the customers in men's clothing stores constituted from 41 to 114 minutes; women's clothing stores, from 45 to 193 minutes; in stores specializing in manufactured consumer goods, from 30 to 84 minutes; and in stores specializing in household commodities, from 19 to 47 minutes.

Meanwhile, in increasing the employment rate and the participation rate of the trade workers, and, consequently, in improving the services provided to the public, a factor of great importance is the providing of incentives for their labor. However, this is still being largely hindered by the existing shortcomings in the organization of trade in the rural areas and in small populated points. The trade network there fails to adhere to the products list for articles in daily demand which are stipulated in the variety list (at times as many as 90-95 percent of the items in the products list are not available). At the same time the public is frequently offered items for which there is no demand. On the one hand, this affects the labor productivity of the trade workers, and, on the other hand, forces the inhabitants to drive to the cities even for such commodities as handkerchiefs, scarves, string bags, and clothes lines, not to mention clothing, footwear, furniture, etc.

The sale of commodities on the basis of custom orders from the public has not been receiving its proper development. For the time being, such sales constitute no more than 2 percent of the commodity turnover in rural areas.

The shortcomings in the providing of trade services to rural inhabitants attest to the fact that the existing system of incentives for labor is not very effective. The system of paying bonuses for the fulfillment of the commodity-turnover plan gives rise to two undesirable tendencies: the lack of desire to encourage during the base period the development of commodity turnover so that the plan will be unstrained; and the striving to fulfill the commodity-turnover plan chiefly by selling more expensive commodities which, as a rule, are not included in the variety list for the stores specializing in

articles in everyday demand. Frequently this also explains the unavailability in the trade network of inexpensive but popular articles.

The low percentage of sales on the basis of custom orders is caused by the higher labor-intensity of this form of trade, as compared with the usual delivery of commodities to the store. Something else that has been hindering the development of this form of trade is the existing system of incentives, since, under the conditions of the application of specific piecework rates for paying for the labor performed by the salespersons, provision is made for the continuous reduction of those rates in proportion to the increase in commodity turnover per salesperson without a consideration of the custom-order sales.

There are also shortcomings in the system of providing incentives for the labor performed by workers in the wholesale link, who also have a self-interest in increasing the sale of the more expensive commodities, by means of which it is easier to fulfill the commodity-turnover plan. They must also be given a material self-interest in the more rapid satisfying of the stores' production orders both for commodities that are part of their mandatory products list, and for those that are being sold on the basis of custom orders from the public.

It would be desirable for the workers in the retail link to foresee a substantial reduction in the bonuses for fulfillment and overfulfillment of the commodity-turnover plan and to introduce a bonus system depending upon the quantity and volume of the public's orders that have been fulfilled. That would make it possible to achieve an increase of many times in the sale locally of everyday articles that have not been stipulated in the variety list, and to reduce the expenditures of time by the rural workers to make trips to purchase them in the rayon centers and cities. If one considers the fact that the rural inhabitants expend a considerable amount of time to make trips to the major cities to buy commodities, an improvement in the trade services provided to the rural population will promote an increase in the effectiveness of the use of labor resources in agriculture.

The improvement of the bonus system does not exhaust the methods of improving the incentives for labor. At the November 1982 Plenum of the CPSU Central Committee it was stated, "It is necessary to create those conditions -- economic and organizational -- that would encourage efficient, productive labor, initiative, and enterprise."

In 1983 in four food stores in Karaganda we carried out an experiment in the application of piecework rates for the individual payment of the labor performed by checker-cashiers depending upon the amount of time they devoted to serving the customers and the quantity of the settlement and checking-and-cashier operations executed. In one of the stores, six checker-cashiers participated in the experiment. The differentiation in their wages during one of the months varied from 102 rubles (with the execution of 7828 settlement and 25,050 checking-and-cashier operations and the expenditure of 28.9 seconds to serve one customer) to 176.5 rubles (19,823 settlement and 55,504 checking-and-cashier operations with a time of 20.1 seconds to serve one customer). If the wages had been computed depending upon the execution of the total

commodity turnover, all the cashiers would have received the identical wages -- 133 rubles each.

The experiment confirmed that the payment for this category of trade workers depending upon the number of checking-and-cashier and settlement operations executed by them encourages the better serving of the customers, and this has a tangible social benefit: lines are shortened or eliminated. In these stores, at the peak hours, the amount of time required for serving one customer dropped during the five-month period by 30.1 percent. The number of customers served by one checker-cashier increased by 22.9 percent, with the number of checking-cashier operations per customer rising by 6.7 percent. The monthly labor productivity of the cashiers during the period of the experiment increased by 20 percent, and the hourly labor productivity, by 10.6 percent. The share of the work time for the checking-and-cashier and settlement operations dropped from 60.6 percent in May to 49.7 percent in September.

There is an opportunity to accelerate the services provided to the customers also by relying on other factors: the most graphic marking of the price when packaging the commodities; the use by the customers of special shopping carts and shopping baskets in self-service areas; the preparation by them of their money and the selected commodities for rapid settlement with the cashier; the packaging of loose commodities in a weight that corresponds to a "rounded-off" price (for example, 1.5 rubles, etc.), which is convenient both for the cashiers and for the customers.

In large stores where 5-10 persons or more are employed simultaneously in the cash-settlement area, as a result of the speedup in the providing of service, it is possible to reduce the number of checker-cashiers. In small stores, where it is impossible to reduce the number of cashiers, the benefit from the speedup of service is expressed in the use of this freed work time to execute other operations in the collective (brigade). That means that one can accept as the indicator of bonus payment the observance of the norm governing the number of workers for the store (brigade) as a whole. Apparently, one should develop composite time norms for the brigade for serving a single customer, and on that basis should construct the norm governing the number of workers (we developed a methodology for determining for the individual categories of workers the time norms for the serving of the customers).

The norm governing the number of workers can be computed by proceeding from the expected average-monthly number of customers and the time norms for serving them. The observance of the norm and the reduction of the number of workers presupposes the efficient use of the work time of all the brigade members, particularly on the basis of the broad combination of occupations with a consideration of the distribution of the customer flows by hours of the day and days of the week.

In order to increase the material self-interest of all the brigade members in the continuous growth of the volume of the work with the same or a smaller number of personnel, it is necessary to develop and employ not only the norms governing the number of workers, but also long-term norms for the wage fund, so that the saving of the wages can be directed toward giving additional payment for the combining of occupations and for the purpose of paying

incentive payments to the brigade members with a consideration of the labor participation of each member. However, the brigade form of organizing labor in retail trade must also include the consideration of the amount of time spent by the customers while waiting in line, which can increase when the number of workers is reduced without substantiation.

The increase in the effectiveness of labor in trade on the basis of improving its organization and the providing of incentives will make it possible to guarantee the sale of an increasing amount of commodities without increasing the number of workers.

COPYRIGHT: Izdatel'stvo "TRANSPORT", "Sotsialisticheskiy trud", 1984.

5075

CS0: 1828/40

EDUCATION

CHANGES IN VUZ ADMISSION PROCEDURES EXPLAINED

Efforts to Recruit Certain Specialists

Moscow IZVESTIYA in Russian 27 May 84 p 3

[Interview with Prof Aleksandr Vasil'yevich Krupin, chief of the Educational-Procedural Administration for Higher Education Under the USSR Ministry of Higher and Secondary Special Education, by IZVESTIYA Correspondent E. Maksimova: "Without an Average Number of Points; New VUZ Admission Rules"; date and place of interview not given]

[Text] In line with the innovations which the USSR Ministry of Higher and Secondary Special Education [Minvuz] has introduced in the VUZ admission rules, IZVESTIYA Correspondent E. Maksimova spoke with the Chief of the Educational-Procedural Administration for Higher Education of the Ministry, Prof Aleksandr Vasil'yevich Krupin.

[Question] What is the nature of the changes and what has brought them about?

[Answer] First of all, of course, the reform of the school and the vocational-technical education system. This has also direct bearing on the higher school, that is, the VUZes in response to how children and juveniles will be instructed by the school and PTU [vocational-technical school]. We train the pedagogical personnel for these. The second circumstance is the acute need for certain types of engineer. Thought must be given to how to find and recruit talented people for these specialties.

[Question] And what are the innovations?

[Answer] There should be a noticeable rise in the contribution of the universities to school education. Recently we have begun organizing pedagogical divisions and faculties, for example, at the Kharkov and Yakutsk universities. Their mission is effective training of higher--university--class teachers for teaching in the senior grades. These faculties and pedagogical VUZes will enroll--naturally, after the passing of exams--primarily those who are sent "as teachers" by the school pedagogical faculty, the specialized secondary school, the PTU, the labor collective and Komsomol committee and the public education bodies.

The faculties training instructors for vocational and technical education will basically admit graduates of the technical schools and PTU. In addition, there will be worker and rural youth, servicemen who have been discharged into the reserves and who show a natural inclination for pedagogical work. We are hoping to find confirmation of this in the recommendations and talks with the persons admitted. An additional benefit is that the teachers, indoctrinators and job training masters with a secondary pedagogical education and at least a year of pedagogical experience will be admitted for further instruction on the job upon assignment of the public and vocational-technical educational bodies. They will not take examinations. In their place will be a colloquium and the content and method of this are now being worked out by the USSR Minvuz and Minpros [Ministry of Public Education].

An important change will be the abolishing of an average number of points on the secondary education documents. The number of points for admission will be taken only from the grades received on the entry exams.

[Question] Does this mean that from now on the VUZes will not take into account the previous grades in instruction?

[Answer] In no way! Those who have received a medal or who have received a diploma with honors from the technical school or secondary PTU as before will take one specialty exam. Having passed it with a five [the highest grade], they will be exempt from other exams. However, let me draw your attention to an innovation: a diploma with honors from a technical school gives such a right only for admission to the specialty which was obtained in the school or is closely related.

Let me mention in passing the acutely scarce industrial and agricultural specialties corresponding to those received in school and technical school as here the holders of honors diplomas will be admitted without any exams at all. The school medal holders also.

[Question] Will the rule continue in effect for the taking of two exams by those who have done well in school?

[Answer] Yes, this advantage is to be kept. If the certificate or diploma have only good and excellent grades, with even just one or two fives, only two subjects must be taken. Fours and fives, that is nine points, are enough to be admitted to an institute. But here also there is a new feature: if it is a question of an acutely scarce specialty, eight points are enough, that is, two fours or a three and a five.

[Question] Are there other changes?

[Answer] Yes. Those who have completed secondary special and vocational-technical schools with an honors diploma or who have worked the established time in a specialty have the right outside of the competition to be enrolled for related specialties. The same right is granted to production pacesetters with at least 2 years of experience if they have been recommended to the VUZes by their own enterprises. Again it is a question of admission to specialties which are close to the area of their work. The VUZ establishes the list of specialties.

For all the remainder, as they are called, "probationers," the rules remain as before, that is, a competition within the total number of places for production workers and this is determined proportionately to the number of submitted requests.

Armenian Admission Procedures

Yerevan KOMMUNIST in Russian 30 May 84 p 2

[Interview with L. Garibdzhanyan, Armenian Minister of Higher and Secondary Special Education, by R. Meliksetyan: "Graduate-84: Admission Innovations"; date and place of interview not given]

[Text] The USSR Minvuz recently made a number of substantial changes and additions to the admission rules for VUZes. These innovations were the subject of an interview given to the newspaper by the Armenian Minister of Higher and Secondary Special Education L. Garibdzhanyan.

[Question] Lyudvig Papikovich [Garibdzhanyan], the VUZ announcements of 1984 admission of course have taken into account certain changes in the rules. Would you please tell our readers about them in greater detail, more completely and systematically.

[Answer] First about the innovations of a broader sort which concern all graduates and all VUZes. As of this year, we are eliminating the provision on counting the average number of points taken from a document showing a secondary education for admission to a VUZ. The competitive selection will be made only in accord with the total number of points gained by the graduate during the entrance exams for the corresponding disciplines.

High grades in school remain an incentive factor. The graduates whose documents for a secondary education contain grades of only "five" and "four" are admitted to institutes from the results of two exams if they gain at least nine points on them. In truth, each VUZ itself determines the range of specialties for which such a privilege is given and this range is rather broad.

Benefits have remained virtually unchanged for medal holders of the secondary school and graduates of the vocational-technical and special schools who have an honors diploma. Having passed one entrance exam with a "excellent," they are immediately admitted to a VUZ. With a less favorable result, with grades of "four" or "three," the graduate continues to participate in the competitive exams. Here the only adjustment concerns the outstanding students of technical schools. The designated privilege is extended to them only under the condition that they enter a VUZ in the specialty corresponding to the one received at school.

Even greater advantages are granted to persons being admitted to the so-called acutely-scarce specialties. Since in our republic in recent years such a classification has not been made, let me explain: among the acutely-scarce are those specialties which are important for the national economy and into which the flow of youth has been declining year by year. In Armenia there are two

such specialties at the Yerevan Polytechnical Institute: "metallurgy of nonferrous metals" and "casting production of ferrous and nonferrous metals." Medal winners from schools and outstanding students from other secondary institutions of learning who have selected these will be admitted without examination as will persons who have the right to take only two exams if they have at least eight points.

Finally, easier conditions have been planned for young persons who have completed the specialized secondary and vocational-technical schools. Their graduates who have received an honors diploma or who have worked in their specialty for the designated time will have the right to be admitted to VUZes outside of the competition.

[Question] You remarked that you would start with the new changes which concerned all the VUZes. Should this be understood that there are also changes related to admission to certain VUZes?

[Answer] Undoubtedly. Specifically it is a question of very substantial changes and supplements in the admission rules to VUZes preparing teachers, indoctrinators and job training masters.

The new rules increase the role of the pedagogical councils of the schools, the specialized secondary institutions and PTU, the public education bodies, the labor collectives and Komsomol committees in selecting the contingent of students for the pedagogical VUZes. Graduates with their recommendations will now have the right of first enrollment in the pedagogical institutes and on the pedagogical divisions and faculties of the universities. A special benefit has also been established for servicemen in regular service who have been discharged into the reserves and have such a recommendation. Two additional points will be added to the points obtained on the entrance exams.

The engineering-pedagogical specialties of the VUZes which prepare instructors for the state vocational-education system will admit, as a rule, graduates of secondary PTU and technical schools, graduates from the worker and rural youth as well as servicemen who have been discharged into the reserves who have a production specialty and show an inclination for pedagogical work.

One other major change for teachers, instructors, educators and job training masters who have a secondary pedagogical education. Having worked at least one year in the specialty, they have the right without leaving their job to be admitted to VUZes corresponding to the area of their work when recommended by the public and vocational-technical education bodies on the basis of results of a colloquium and without entrance exams. Let me use this occasion to recall that the entrance exams for the correspondence divisions of the pedagogical VUZes commence on 1 June and very few days remain for the future correspondence students to get in their applications.

[Question] All these measures, undoubtedly, will tell favorably on the training level of public education workers. But will they make it possible to eliminate the obvious paradox in this area, that is, the "overproduction" of teachers for many disciplines in the city and at the same time their acute shortage in the remote areas?

[Answer] This problem is in fact particularly acute precisely in the pedagogical VUZes. A young engineer who has graduated from the Yerevan Polytechnical Institute willingly will leave Armenia for Chukotka or Yakutia or any other corner of our motherland while his pedagogue classmate tried by every rule and trick to avoid being sent to an area just 2 or 3 hours distant from Yerevan. It has gone so far that we have been forced to send students from their senior years as Russian teachers to the schools of certain areas.

The situation which has arisen, in my view, is above all the result of poor ideological indoctrination among the students, of avoidance by the VUZ faculty and social organizations of the pressing task of the day and of indoctrinating feelings of duty, responsibility and citizenship among the youth. We feel that in the process of carrying out the school reform this question will be resolved.

For now we are still more widely introducing the noncompetition admission of future teachers to VUZes. This year, for example, 191 places have been assigned to 32 rayons of Armenia for noncompetition admission for teacher specialties which the schools need. For the first time such admission has been organized for the preparatory divisions of the pedagogical VUZes.

Generally speaking, we see the system of assigning young persons to VUZes for study as very promising. For the first time this year 70 persons will be admitted outside of the competition to each of the Armenian Agricultural Institute and Yerevan Zooveterinary Institute and places for this in the light industry specialties have been assigned at the Leninakan affiliate of the Yerevan Polytechnical Institute for inhabitants of all the cities and rayons of Armenia. Special places have been set aside for four rayons of the republic in the Yerevan State Conservatory, and a noncompetition admission is also to be organized for the music schools.

It remains to be hoped that the executive committees of the rayon societies, their public education sections and other bodies sending young people for special studies will show greater responsibility and attention to this question. I emphasize this with reason. Unfortunately, there have been frequent instances where the places assigned to specific rayons have remained "empty" even at such popular institutes as the medical one where for more than a year now a noncompetition admission has been organized for the preparatory division.

[Question] Please tell us about the VUZ admission this year in the republic.

[Answer] This year, the 13 VUZes and their three affiliates operating in Armenia will admit 11,765 students under all forms of instruction, including 9,025 persons for full-time students. In comparison with last year, there are two changes. At the Armenian Agricultural Institute they have closed down the specialty "canning engineering" (a daytime division) and by reducing the admission to the full-time course by 160 places have increased admission to the evening and correspondence divisions of certain VUZes.

The admission commissions of the republic VUZes have already begun their work to prepare for this important, responsible campaign. Together with the rectors, the party, trade union and Komsomol organizations of the VUZes, they will do everything so that the entrance exams are conducted clearly, in an organized manner and on a high level.

Ukrainian Educator on Admission Changes

Kiev PRAVDA UKRAINY in Russian 5 Jun 84 p 4

[Interview with V. M. Krasnikov, chief of the Educational-Procedural Administration for Higher Education of the Ukrainian Minvuz, by S. Litvinova: "For You, Graduates"; date and place of interview not given]

[Text] New admission rules to the nation's VUZes have been approved. The USSR Minvuz, proceeding from the documents on the school reform, has made certain major changes in the admission procedures. What is new? The future graduates and their parents are asking. The editors asked the Chief of the Educational-Procedural Administration for Higher Education of the Ukrainian Minvuz V. M. Krasnikov to comment on the essence of the adopted changes.

[Question] Vladislav Mikhaylovich [Krasnikov], what changes have been involved in the admission rules this year?

[Answer] Probably the most important one is that now the "school points" do not count in the competition. The average arithmetic grade which was figured from the data of the document showing a secondary education from now on will not be taken into account in admission to a VUZ. The competition is conducted on the basis of the entrance exam grades.

[Question] Does this mean that no attention is paid to the certificate?

[Answer] No, its role is important. Particularly in these instances. A secondary education document without any "threes" gives definite rights to its holder. If he has passed two entrance exams with at least nine points (but for specialties and forms of instruction established by the VUZ) then this is enough. If one is seeking admission to acutely-scarce specialties for the metallurgical, mining, oil and gas producing industries, construction, transport and other leading sectors, then if you obtain at least eight points on two exams you will be admitted.

[Question] What rights do the graduates of the PTU have?

[Answer] The admission conditions for them have been somewhat changed. For example, those who hold an honors diploma for completing a secondary PTU, if they receive a "five" on the first entrance exam set for the corresponding specialty upon the discretion of the VUZ, are generally released from the further taking of exams. This right has also been extended to the outstanding students of technical schools (on the basis of a secondary education). But only in the instance that in the VUZ they select a specialty corresponding to the one already obtained at school or a similar one.

[Question] The implementing of the reform in the general education and vocational school depends upon the training of the necessary specialists. Has this also been reflected in the admission rules?

[Answer] This year we plan primarily improved recruitment of young persons for studying in the VUZes training teachers, instructors and job training masters.

In the first place, teachers, instructors, educators and job training masters who have a secondary pedagogical education and at least one year of pedagogical experience can study without leaving their job at VUZes which correspond to the area of their work. However, under the condition that they have been recommended there by the public and vocational-technical education bodies. Enrollment is carried out on the basis of the results of a colloquium.

Secondly, those who come to the VUZ in order to become a future teacher, instructor and job training master, in having recommendations from the pedagogical councils of the schools, the secondary PTU, the specialized secondary schools, public education bodies, labor collectives and Komsomol committees, are admitted as students even under special circumstances. They are not eliminated from the competition having received one or two points less than the existing passing grade on the exam.

[Question] Please tell us in more detail about the advantages for those being admitted to VUZes.

[Answer] At present, there is a broader range of persons who have been given the right to noncompetition enrollment. These are production pacesetters with at least 2 years job experience and who have been sent to the VUZ with an enterprise scholarship to study a related specialty. Benefits have also been extended to the graduates of the PTU and specialized secondary schools who are admitted to the corresponding specialties if they have an honors diploma and a length of employment set for a young workers in the obtained profession or specialty.

[Question] What are the new forms for organizing admission in the Ukrainian VUZes?

[Answer] In all the 146 republic VUZes a search is underway.

In the aim of improving the quality of training for the pedagogical cadres in the universities of the Ukrainian Minvuz, separate admission has been introduced for 12 specialties in the scientific-pedagogical area.

The admission commissions of the Ivano-Frankovsk Oil and Gas Institute, the Lvov Forestry Engineering Institute and the Ukrainian Water Management Engineers Institute are traveling to the eastern oblasts of our republic where admission is being made.

For increasing the objectivity of assessing the knowledge of the graduates, we are continuing to recognize entrance exams employing a computer. At present, 14 VUZes of the Ukrainian Minvuz have joined the experiment.

One other innovation. The period of instruction has been shortened for the basic technical specialties for which graduates will be admitted from the corresponding specialized secondary schools. For example, instruction will be

shortened by 18 months for evening students who at the Donetsk Polytechnical Institute have mastered the technology of underground working of mineral deposits. The same period has been set for students in the Ukrainian Correspondence Polytechnical Institute who have decided to choose the specialty production methods of machine building, metal cutting machines and tools as well as for the correspondence students of the Dnepropetrovsk Institutes. In construction engineering this concerns the future specialists for industrial and civil construction and in the metallurgical institute for ferrous metals metallurgy.

[Question] This year can the VUZes propose new specialties?

[Answer] Of course. There are plans to broaden the training of specialists for the basic industrial sectors for eight scarce specialties using the daytime form of instruction. And for evening and correspondence instruction this will be done for 43 specialties. For example, the Kramatorsk Industrial Institute will begin training personnel for automated metallurgical machines and units, the Chernovtsy State University for applied mathematics and Kharkov University for the history of the CPSU.

These are the new features which await those who have decided to be admitted to a VUZ.

Educator Reviews Role of Entrance Exams

Moscow IZVESTIYA in Russian 23 Jun 84 p 3

[Interview with N. F. Krasnov, USSR First Deputy Minister of Higher and Secondary Special Education, by E. Maksimova: "Exams Behind, Exams Ahead; Soon it will be VUZ admission time. How will this be this year?"2

[Text] Admission to institutes is a very responsible moment in the life of not only the higher school but also many families. For instance, if each applicant had just two supporters, his parents, then this would be 2 million persons. But there are also the grandmothers, grandfathers, relatives, teachers and friends.... Tens of millions of people, without exaggeration, are now concerned for those who are about to make their first independent and most important step in life.

We asked N. F. Krasnov, USSR First Deputy Minister of Higher and Secondary Special Education, to answer several questions concerning the graduates and their near and dear.

[Question] An exam lasts 15-20 minutes but it decides so much! The examiner knows nothing about the person sitting opposite him, neither inclinations, interests or even the presence of a medal. It is not so difficult to separate knowledge from ignorance although there are mistakes caused merely by excitement. But there are also other differences such as a smooth answer and understanding, a mechanical repetition of what has been read and the ability to explain relationships and the patterns of a phenomenon. Just what should the exam prove?

[Answer] The ultimate purpose of all exams is to select for a higher education a person capable of assimilating the fundamental and professional knowledge which is essential for a specialist who meets the needs of the times. Ideally, an examination should determine, in addition to the scope and level of knowledge, certain other personality traits. Certainly from the individual we will train a highly skilled specialist, a leader and creator of progress! And the examiners have been given all in all about an hour plus the time for a composition or written work to recognize this.

They say that in order to know a person you have to eat a spoonful of salt with him. But in an acute situation an exam without fail involves emotions and it is possible to "get a feel" for the person and discover intellectual and even volitional capabilities more accurately than in the process of extended, even relationships. The art of a good examiner consists in this and his comment shows these qualities of the graduate.

He sees how a person begins to answer, that is, immediately and decisively or resorts to cunning. The rejoinders, stipulations and replies to a question, even a glance will show a great deal whether the person is thinking or recalling what the textbook wrote. The outline of a reply or a rough note--here is where they must look. Everything is there in the exam and you must merely know how to spot it.

Alas, formal routine school recommendations do not help to gain a correct notion of a person being admitted. With other conditions being equal, they are important for guidance. But generally speaking, practice indicates that the total of the grades obtained on the admission exams gives a right, if not to judge with complete certainty, at least to raise certain hopes. The higher this grade is the higher, as a rule, the results of VUZ instruction.

[Question] Let us put it this way: the level of knowledge is an essential condition but not a sufficient one?

[Answer] And here is confirmation: how many persons are eliminated from the institutes who passed the competition! Why? There is not enough tenacity and endeavor and these are lacking because there is no interest, the profession does not match the individual. And for this reason we have indifferent physicians, middling teachers and incapable engineers. It certainly is.

Very essential for us is the general pre-VUZ and vocational development of a person, his prehistory. In the admission rules this has been provided for in a certain manner in that we taken into account the laudatory certificates, victories at olympiads and competitions. We provide advantages to rural inhabitants for admission to the "rural" specialties and to the railroad VUZes to those who have worked on the children's railroad.... The new rules which stem from the reform in the secondary school, these benefits have been broadened particularly for those being admitted to the pedagogical VUZes and generally for those who after a technical school, a PTU or several years of work go back to a VUZ for a related specialty.

This year, the Moscow Aviation Institute has been conducting an experiment. A special commission assembles data--please note, confirming by document--on the

interests of the graduate. Perhaps the student has done well at the institute school for physics and mathematics, he has engaged in aviation modelmaking, he has records, is a master of sports, a participant in exhibits, and has worked in his future specialty.... In admission the institute will proceed not only from the examination grades but also from these "professional" successes for which an evaluation scale has been worked out.

[Question] However, Nikolay Fedorovich [Krasnov], you will agree that an exam is still something of a lottery. Even Tsiolkovskiy said that we approach such a "task of social organization whereby talents should not be concealed or missed."

[Answer] Yes, the element of chance cannot be eliminated, particularly in the borderline area between "3" and "4," "4" and "5." But again, experience does instill optimism in that a failure or a lack of points does not eliminate capable young men and women from the VUZ. After a year or two they do become students.

[Question] Generally speaking, an exam grade in its very nature is subjective....

[Answer] Without any doubt. The examination requirements are not a line but rather a zone. The task is to make this as narrow as possible.

[Question] Hence we must talk about the examiner.

[Answer] This is the question of questions. The correct selection of the examinees is a function of the correct selection of the examiners. Are experts on the subject needed? Undoubtedly. But that is only half of the question. An examiner in an admission session is a type of character, unfailingly conscientious and full of curiosity about the young people. This means principledness and conscientiousness, patience and quiet. An emotionally disturbed examiner is very dangerous.

[Question] Disturbed?

[Answer] Yes, unbalanced with shattered nerves and diverted attention. I will not even speak about crystal honesty as this is above all else. A feeling for oneself as an agent of a society which is presently forming its intelligentsia of tomorrow. The intelligentsia of the 21st Century.

The instructor should also prepare for exams. And not only in informational terms but also psychologically. He must attune himself in a definite manner to study the young individual.

[Question] Certainly here a good deal also depends upon the attitude of the VUZ, to select or, forgive me, reject?

[Answer] You understand that our recommendations, even our orders insist on one thing, discovering knowledge and selection. But certainly examiners are not machines but living people. The competitive situation does have its influence with a large competition suppressing and intimidating and a small one weakening.

One situation develops in the technical VUZes where there are two or three persons per place and a different one in the medical, legal and commercial ones where there are five or eight.

Just imagine the first examination, the numerous groups, flows of people and the sensation of an approaching human wave with everyone desiring to get into the "boat" with a limited number of seats. For this reason I, in using the opportunity granted me, would like again to remind the rectors that the first exam is the most dangerous in this regard and you must be on guard! The rector, and upon his authorization, the deans and heads of chairs must precisely during these days supervise and, if need be, correct the level of exactingness along the way.

[Question] In a word, an exam is high professionalism reinforced with high morality.

[Answer] This is the most complex type of pedagogical activity. Not only the answer but the very question itself, each word in it should have a clear specific purpose. Let us assume, for an outset the examiner wants to ascertain, so to speak, the scope of knowledge. Incidentally, we should not confuse cramming and knowledge and we must not discriminate against this knowledge. The accumulating of information is an essential level to use knowledge. The complete mastery of it is another question, a second step.

There are also irresponsible questions, particularly supplementary ones which not even the examiner himself could answer. Such extraneous questions should be completely excluded and for this, incidentally, we have introduced a new form of oral reply sheet on which questions are recorded asked above the ticket.

[Question] The building material for all questions, naturally, should be the school curriculum.

[Answer] It is the limiter, the framework beyond which we must not go. But within this, of course, the answerer can understand soundly and superficially, precisely and tentatively.

[Question] But there are no absolute criteria as there are different VUZes and different students....

[Answer] We are in favor of a unity of requirements. Regardless of the category or the scientific-pedagogical potential of a VUZ, ignorance is ignorance whether it is at MGU [Moscow State University] or in a young peripheral VUZ. A two should show this in either place. But there will be a certain discrepancy in the positive evaluations.

[Question] What do you, Nikolay Fedorovich, feel about the replacing of oral exams with written ones?

[Answer] From the standpoint of criteria, such an examination provides greater objectivity and causes greater confidence among the graduates themselves. The questions can be selected more systematically, they can be logically connected and the course covered more completely. This is all well and good. But we must not absolutize the pluses of a written exam. There is no live exchange with a

person, when a personal question can be answered, approval be given or a random mistake corrected. Again, what can be good for some VUZes maybe unsuitable for others.

[Question] Last year, I attended the exams at the Leningrad Mechanics Institute. It was the first among the Leningrad VUZes, after the Economics-Statistics Institute in Moscow, to conduct all exams in a written form. There were 20 questions on mathematics and 12 on physics. There was no nervous strain as 3 hours were provided for reflection and the law of large numbers was let work as there were many problems! The computer assembled them into variations and then gave the grades.

[Answer] There you are! Not only is it important that everything is written out on paper but also the computer does the grading. No VUZ could handle such an exam either in terms of the level of instructor thinking or the equipping with electronic devices. Here there should be flexibility. For example, there is the Moscow Higher Technical Institute imeni Bauman, a highest class institute, and it is a supporter of traditional methods.

This year, 91 VUZes are giving machine mathematics exams. We will follow the long-term results. Possibly we will give mathematics and physics in this manner everywhere and perhaps sometimes other subjects which can be algorithmized.

[Question] I would particularly like to ask you about the medal holders. Have they justified their brilliant recommendations? After the examinations we usually have a lot of letters stating that a person has had all fives but has still not been admitted to a VUZ.

[Answer] The medal winners are the glory and pride of our school. Having been admitted to a VUZ, many of them are among the best students. But not all, unfortunately, succeed in surmounting the barrier even of the first competition. A very impressive portion of the medal winners does not get admitted to a VUZ. What is the matter? On the one hand, the school has not been sufficiently demanding and on the other, one must not complain and feel that a medal in and of itself is a guarantee of admission. It helps this to the degree that it shows better knowledge in comparison with other classmates. It is a pass but the door must be opened by the student himself. The more industriously one has studied the greater the chances there are to get in.

A competition is a contest, a struggle, and in it without fail there will be winners and losers. Is this a shame? Certainly. Only one must not accuse others of the defeat or seek the reasons where they do not exist. One must immediately get to work and not refuse to continue one's education. It is possible to be admitted to a correspondence VUZ or an evening one, it is possible to return, now as a production worker, to that same institute a year or several years later.

[Question] What is the attitude of the ministry towards the publicizing of exams?

[Answer] We are in favor of maximum information because it is the best guarantee of objectivity. Everyone can know the ranking, the nature and results of

the exam, and the change in the competition situation after each one. The appeals can be carefully analyzed by competent, responsible workers. We have no secrets from the parents! They have the right, along with their son or daughter, to examine the written work after the examination, the course of solving the problem, the content of the oral answer or without any trouble go see the dean or rector.

Some places make it a practice to hold a session of the admission commission devoted to enrollment in a large auditorium in the presence of the interested people. We must also in every possible way encourage and increase the role in admission of the social organizations, the party, Komsomol and trade union ones.

Here, probably, there is both the time and space to recall the organizational aspect. There are VUZes where the young people for hours, leaning against the walls of the corridors, languish waiting for the exam. Can an athlete excel or show a high result if prior to this he squanders his time uselessly by the hurdle which must be taken? The children need quiet conditions. They are already under stress and there is no need to add difficulties and generally create an atmosphere of bureaucratic mystery or increase fear.

[Question] What are your wishes for the graduates?

[Answer] To all I wish confidence in themselves and in us, the workers of the higher school. On 1 September in our auditoriums we would like very much to meet the young people and celebrate the Holiday of Knowledge with them about whom it could be said that they and the VUZ were fortunate to find each other.

Improvements in Teacher Training

Moscow SOVETSKAYA ROSSIYA in Russian 16 Aug 84 p2

[Interview with Prof A. P. Petrov, rector of the Moscow State Pedagogical Institute imeni V. I. Lenin and corresponding member of the USSR Academy of Pedagogical Sciences, by G. Zhavoronkov: "The Teacher Should Be Talented"; date and place of interview not given]

[Text] Entrance exams are underway for the nation's pedagogical institutes. Who are they, today's applicants and future teachers? This was the subject of discussion between our correspondent G. Zhavoronkov and the Rector of the Moscow State Pedagogical Institute imeni V. I. Lenin, corresponding member of the USSR Academy of Pedagogical Sciences, Prof A. P. Petrov.

[Question] Aleksandr Petrovich [Petrov], during the year when party and government decrees have been approved on reform, the question of who will be admitted to a pedagogical institute, you will agree, is assuming particular importance.

[Answer] We, the workers of the higher pedagogical school, were probably the first to feel the effect of the reform through the abrupt change in the attitude of the graduates to our institute. In order to prove this, let me give just several figures. In comparison with last year, 25 percent more applications were submitted. Mail graduates applying increased by more than 60 percent.

On certain faculties, I would say, a "critical" situation has arisen. For example, on the history faculty we can admit 100 persons. There are some 160 male applicants. And another 40 persons have come from the preparatory faculty. Thus, the men must undergo an unprecedented testing for a pedagogical institute. Two persons are competing for each place. We have every reason to assume that the first year of today's recruits will be more than 25 percent men. This cannot help but please us. There has long been the need to break the existing prejudice that pedagogics is a woman's world. In saying this, I do not mean to understate the role of the female teacher. However, at present as never before, we are feeling an acute need for male teachers in the schools.

Not only the change in the material status of the teacher has increased the interest of students in pedagogics but also the change in the social climate around it.

Let us recall that millions of people including workers, writers, cosmonauts and scientists, participated in discussion of the draft reform. Probably never before have teachers heard addressed to them so many kind but also alarmingly demanding words. Never before has this profession been exposed to such a stormy and concerned discussion.

And it is not only the school children who have struck up an interest in the profession of a pedagogue but also those who have already experienced life. At present, the institute is admitting more than 150 former servicemen. Among them are communists who undoubtedly will become a support for the VUZ Komsomol and party organizations.

[Question] A teacher, like a writer and an artist, must obviously be born. What, in your view, are the natural givens of this talent and how can they be identified in the process of admission?

[Answer] The natural givens of pedagogical abilities, like other inclinations, are best discovered in the process of protracted and objective observation. And who better than a teacher can see this? Is a person willing to "part" with knowledge or "save" it for maintaining an intellectual superiority over others? Can he in a collective be a leader or is he only essentially one led?

For this reason, along with the public education bodies, for 4 years now we have been conducting an experiment for preferential admission of school-recommended students to the pedagogical institute. These young people undergo unique testing among their fellow classmates and pedagogues for their desire to work with children, their kindness toward them and their ability to understand a difficult character and find the unique "key" to shape a socially active personality. It is still too early to speak about the final result of the experiment. But the very fact that among those admitted specially there is the least percentage of dropouts and the highest percentage of Komsomol and student group activists shows the correctness of the chosen path.

[Question] In some places they are establishing pedagogical classes. What do you think about this initiative?

[Answer] This is a reasonable way to ascertain talents, if the goals and tasks are correctly set. But in some places they have understood this form as legitimate rehearsal or "coaching" for the exams to the institute. We are categorically against such an approach. In the Moscow schools where they have organized the pedagogical classes, this problem does not exist. Completely different problems should be solved in the pedagogical classes. There the children should play out various situations which could arise in the future and master the didactic and psychological procedures. They should learn to speak with school children and with their parents.

In such a situation of search and creativity, each person can test his desire to become a teacher and we test his capabilities to be a teacher.

[Question] The admitting of graduates to many VUZes is determined by the taking of an exam in a special discipline. Some have completely switched over to the form of colloquium on the specialty subject. Has the time not come to introduce such a rule at the pedagogical institute?

[Answer] I do not know how my colleagues will view my opinion, but I would completely abandon entrance exams. This is not the most precise criterion from which one could determine the correctness of the chosen profession. Exams are truly a lottery in which one can win and one cannot....

In my view, a competent commission comprised of teachers, psychologists, pedagogues and representatives of the public organizations can much more precisely and objectively select worthy applicants not in terms of the level of knowledge but rather in terms of the focus of knowledge and interests....

[Question] Desire and interest are not learned by heart!

[Answer] Precisely so. It is possible to be a brilliant physicist, geographer or literary critic but at the same time be a bad pedagogue.

In school it does happen with teachers that they know their subject brilliantly but the children do not listen to them. Why in pedagogics are there people who are not listened to?

The first step has already been taken in this area. We admit to the evening division working students who have completed pedagogical schools without examinations and on the basis of a colloquium. Obviously, we must also take a second step. As an experiment in one or two VUZes they are also admitting to the daytime division according to the results of the colloquium.

[Question] At present the school programs and teaching aids are being revised. At one time the change in the mathematics textbooks to some degree set the children at "odds" with their parents. The parents "raised" on Kiselev and Peryshkin understood nothing in the new textbooks and from the children heard such typical complaints as "oh, mamma, oh, daddy, you can't understand anything that they want from us!"

The present students are learning to work with the old textbooks and arriving at the school will be given new ones. Will we not now set the teacher "at odds" with the student?

[Answer] In nature there is virtually no such clearly expressed contrast, that is, some textbooks in a VUZ and other ones in a school. But I would call the textbook problem one of the most complex. We must not repeat the problem with the mathematics textbook. I had the good fortune of studying with A. V. Peryshkin. Several generations have been raised on his text. But still we must not absolutize any textbook as time itself places constantly new demands.

I feel that we will not put the young teachers "at odds" with their students. In the first place, the conversion to the new teaching aids will be carried out gradually and, secondly, many of our instructors have participated in preparing the textbooks and they do not intend to hide any secrets from their students.

Equally important on this level is the work with the programs [curricula]. I consider it reasonable to also prepare the parents for the new programs and textbooks so that you would not hear such complaints as "oh, mamma!" The parents should be full allies and assistants of the school. Just look how the educational level of the family has risen! Just 30 years ago out of 1,000 workers only 15-20 percent had a secondary and higher education. At present, the figure is 800 persons out of 1,000. This is an enormous army of home teachers and school assistants and it would be unforgivable not to consider this.

[Question] May it not happen that in subsequent years a large number of graduates from the pedagogical VUZes will try to work wherever they like, providing not in a school?

[Answer] This could happen for one reason: if we are not seriously concerned with recruiting the teacher personnel. If we do not establish a long-range system for indoctrinating future teachers along with the school.

The school keeps asserting: give us teachers, give us teachers! But we will not solve the problem until the school itself is not concerned for replenishing and replacing its personnel. The students should return to their schools as teachers. Then the school and the VUZ will be communicating neighbors.

Three years ago, as an experiment, we introduced at an institute practice teaching from the first year as has long been done in medicine. Future doctors from their very first year see their patients and can check themselves as to whether they are capable of the chosen profession or not? Our students begin practice teaching only in the fourth year. And sometimes they suddenly realize that pedagogical activities are alien to them and moreover contraindicated. But three years have already been wasted....

One other experiment. This year, on one faculty we want to allocate the students not in the fifth year but in the fourth. For an entire year the student will work 2-4 hours a week at the same school which should become his home school. And we have also established the institution of probationers. For three years each graduate should maintain contact with his chair. In the probation process, he gains greater educational skills, he adds to his theoretical knowledge and seeks out his own inimitable work style. Certainly real teacher creativity is not blind copying but rather the constant search for new forms and the talented continuation of the already known and found. Such work cannot help but be interesting and hence cannot help but be prestigious.

EDUCATION

SCHOOLS ACCOMMODATE PROGRAMS TO PRODUCTION NEEDS

Moscow SOTSIALISTICHESKIY TRUD in Russian No 7, Jul 84 pp 48-54

/Article by Yu. Averichev, chief of the Department of Labor Training and Vocational Orientation, USSR Ministry of Education: "Cooperation Between the School and Industry--The Basis of Preparing Pupils for Work"/

/Text/ The task of radically improving labor upbringing, training, and vocational orientation in the general education schools was set forth in the basic directions of the general education and vocational school reform, as approved by the April (1984) Plenum of the CPSU Central Committee and first session, 11th convocation of the USSR Supreme Soviet. Labor upbringing is viewed as a most important factor in shaping an individual's personality and as a means of satisfying the national economy's needs for labor resources.

"In order for Soviet society to move confidently toward its great goals," General Secretary of the CPSU Central Committee, comrade K. U. Chernenko emphasized in his speech at the Plenum, "each new generation must be raised to a higher level of education and general culture, vocational skill, and civil activity. One might say that such is the law of social progress."

Correctly formulated labor upbringing, training, and vocational orientation, and direct pupil participation in socially useful productive work will help the pupils acquire a conscientious attitude towards their studies, become good citizens, and facilitate their moral, intellectual, and physical development. The paramount task of the general education schools is to inculcate into pupils a love of labor and respect for working people, to familiarize them with the basics of modern industrial and agricultural production, construction, transportation, and the services, to develop labor skills in the young boys and girls in the process of their studies and socially useful work, to induce them to make a conscientious choice of their life's work, and to make sure that they get an initial vocational preparation.

The specific measures for fundamentally improving the preparation of general education pupils for work are defined in the decree of the CPSU Central Committee and USSR Council of Minister "On the improvement of Labor Upbringing, Training, and Vocational Orientation of School Children and the Organization of Socially Useful and Productive Work for Them." The time allotted for labor training and socially useful productive work for pupils has been significantly increased. It has been established that pupils in the first through fourth grades should have elementary skills in manually working with various materials, the cultivation of agricultural plants, and should become familiar with certain vocations. Pupils in the fifth through seventh grades will receive more fundamental general work preparation of a polytechnical nature and get an idea about the sectors of the national economy. Beginning with the eighth grade, pupils will get training in the mass vocations in accordance with the national economy's need for personnel. Labor upbringing, training, and vocational orientation will enable the pupils to make intelligent choices of vocations and educational institutions to continue their education by the time they finish junior high school. By the completion of high school, graduates will have a specific vocation and will pass the qualification examinations in the established manner.

Pupils will be obliged to participate in socially useful, productive work in training shops both in enterprise sectors and organizations, in inter-school training-production combines, school and inter-school training and production-training workshops, subsidiary farms, in pupil production brigades, links, school forest areas, and other labor associations. In addition, the pupils will be more broadly involved in self-help work projects, such as cleaning up the school grounds, repairing school equipment, growing agricultural products for the school dining hall, etc., as well as volunteer work during the summer vacation.

Also slated are measures for the further development of inter-school production-training combines, training shops and enterprise sectors, pupil production brigades, increasing the supply of training vehicles for the schools as well as transportation, equipment, instruments and materials for labor training. Introduction of the course "Principles of Production, Vocation Selection" into the schools will help the pupils improve their work in vocational orientation. The role of the ispolkoms of the local Soviets of People's Deputies will also be enlarged in creating the necessary conditions for the pupils' work preparation, for defining the types of pupil work training, job placement for general education high school graduates, and planning the assignment of junior and high school graduates along the various directions of their further training and job placement.

The decree attributes particular significance to strengthening cooperation between the schools and industry. Base enterprises (organizations) will be attached to all secondary, nine-year as well as special general

education schools which, together with the general education schools, will be responsible for organizing pupil work training. According to the rights of their structural subdivisions, they will organize school and inter-school production training workshops, training shops and sectors directly at an enterprise and in an interschool production-training combine, pupil production brigades, senior pupil labor detachments, and other pupil work associations, and they will make available to the pupils individual work areas within their own premises. The base enterprise will participate in strengthening the schools' material base, the outfitting of training workshops, work training laboratories, provide the school with equipment, machinery, and materials, and construct and repair facilities for pupil work training. The base enterprise will send its own personnel to train the pupils, organize their productive work, undertake educational work with them, and develop technical creativity.

Such cooperation between the schools and industry must be based on available experience. At the present time there are about 2.7 thousand inter-school production-training combines in the country where more than 40 percent of the senior pupils are being trained. In most of the production-training combines productive work is an obligatory element of the pupils' work preparation. Those combines emerged, exist, and are developing because of cooperation between organs of national education and industry. The pupil production brigades, which were organized through efforts of the schools, kolkhozes, and sovkhozes, have now been in operation for 30 years. The school forestry areas, the work and recreation camps, and the senior pupil labor detachments are also the result of joint efforts on the part of the schools, enterprises, and farms. Enterprises are increasingly participating in the organization of pupil productive work in school workshops, in the creation and operation of vocational orientation laboratories in the schools, in introducing the pupils to technical creative work and agricultural experimentation, and to production efficiency and inventiveness. Administratively, this kind of cooperation was structurally attached several years ago to the secondary schools of the base enterprises. Many republic and union ministries and departments, particularly, the USSR Ministry of Agriculture, the USSR Ministry of Light Industry, and others have started to devote considerable attention to joint operations between the schools and enterprises. An increasingly noticeable role in the coordination of efforts between the schools and industry is being played by the union, republic, kray, and oblast inter-departmental councils for the vocational youth orientation, the city and rayon committees for pupil vocational orientation and job placement for secondary school graduates.

Socially useful work is an important link in the system of pupil work preparation. Considerable experience in this matter has already been gained by many schools. Let us take, for example, Secondary School No 127 of Minsk. That school has over 1,400 pupils. The base enterprise

is the Rembyttekhnika plant. An excellent job has been done here in equipping and outfitting the handcraft class for pupils in the first through third grades, the cooking and cloth weaving classes and sheet metal shops for pupils in the fourth through eighth grades. Pupils in the ninth and tenth grades are getting labor training in the rayon inter-school UPK /uchebno-proizvodstvennyy kombinat (production-training combine)/ which was created through the participation of a number of enterprises. Together with pupils from other schools they are acquiring automobile engineering, metal-working, wood-working, and other skills, and thereby fulfilling orders of the base enterprises.

Socially useful, productive work has become an important factor in the labor and moral upbringing of the school's pupils. They are acquiring work skills both during and outside of regular class time. They are assigned projects for the school, self-help projects, orders of the base and other enterprises, kindergartens, etc. In the 1982/83 school year, girls from the seventh and eighth grades in the domestic service work classes sewed 120 fillets for school attendants, 145 units of children's clothing for the Children's Home. In addition, girls in the fourth through eighth grades, in the process of their training, sew skirts, aprons, and other things for themselves. In the school shops boys in the fourth through eighth grades make scroll-saws, planes, hack saws, carpentry and other tools, various accessories, demonstration models, shelves, cabinets, tool and material storage chests, work benches, magnetic boards, visual learning aids, household equipment, non-standard equipment for gymnasiums, etc. For the dependent kindergartens, they also make toys, shovels, scoops, and work tools and instruments.

School children participate in scrap metal collection, waste paper, repair furniture and equipment, books, visual learning aids, and take care of school grounds flowers and shrubbery. Ninth graders undertake annual school repairs in June and simultaneously take their production practice at the inter-school UPK. The work of the school technical clubs is also directed toward socially useful work. Here the pupils are engaged in production efficiency and invention projects which, to a large degree, facilitate higher productivity, a saving of materials and electric power in the school shops, and better product quality of the items made in the shops. For example, a dovetailing machine, made by the young technicians, has significantly raised the productivity of the pupils' manufacture of boxes. Various accessories are made for the workshops in the technical clubs. The pupils' summer vacation time work has been well organized. The school had a pioneer camp on its grounds in June and July of 1983. The children who were taking their vacation at the camp were engaged in school grounds care and gardening, book repair, and the compilation of catalogs for the school library. In July, 55 senior pupils worked in a work and recreation camp taking care of cabbage and best plantings in a sovkhos. Thirty four other senior pupils participated in the construction of the Minsk Secondary School No 159 by putting equipment in place and removing construction scrap, etc. Pupils in the school's ninth grade spend ten days every year in September-October harvesting carrots in a suburban sovkhos.

Inasmuch as the school children systematically participate in the creation of physical assets, they develop a caring attitude toward socialist property. Work in a collective helps to develop within the children a sense of comradely mutual assistance, responsibility, assiduity, and has a positive effect on discipline. Socially useful, productive work, in connection with labor training, technical creativity, and vocational orientation, to a large measure facilitates the pupils' readiness to select a vocation. In 1983, approximately 40 percent of the school's eighth grade graduates became workers or entered vocational-technical schools.

Long-standing and fruitful cooperation has marked the relationship between the Kudinov Secondary School imeni V. N. Tsvetkov and its base enterprise, the Order of Labor Red Banner State Livestock Breeding Plant imeni V. N. Tsvetkov (Maloyaroslavetskiy Rayon, Kaluga Oblast). Workshops, a domestic service work laboratory, and an experimental-teaching sector were organized in the school through the active participation of the enterprise. The school has an interschool training combine which trains not only the pupils of its own school, but senior pupils from four neighboring schools. The State Livestock Breeding Plant and several other enterprises have participated in the outfitting of the shops and laboratories in the combine. The pupils fulfill orders of the base enterprise in the process of their labor training, and during their production practice period as well as during the summer vacation period, the pupils work at the breeding plant in the capacity of a pupil brigade. The plant helps the students to cultivate potatoes, vegetables, fruits, berries, and fatten swine for the school dining hall.

Materials about the base enterprise represent a significant part of the equipment in the school's vocational orientation laboratory. All of the work on preparing the pupils for work and choosing a vocation is supervised by the school council for vocational orientation of which the plant director is a member. At the present time more than 60 percent of the breeding plant's specialists are graduates of the school. In the last three years alone, approximately 100 of its former pupils have joined the ranks of the plant's workers.

Pupils in the fourth through eighth grades at Volgograd's Secondary School No 133 have been taking labor training in the production-training workshop (senior pupils train in the UPK) for more than ten years. Outfitted in the primary base enterprise, the workshop has a sheet metal, machine tool, and two electric shop sectors. The school also has a sewing shop. The pupils in the fourth through eighth grades in the work classes acquire knowledge and skills in the mechanical processing of various materials, electrical engineering, make bolts, nuts, spindles, pegs, and other parts as ordered by the base enterprise, assemble livestock self-feeder units, and electrical insulator chains. The girls sew soft containers for the enterprise.

Teachers and personnel of the base enterprise train the children and organize their productive work. In doing what they can to help the enterprise, the pupils learn to work according to a plan and qualitatively learn the rudiments of the working vocations.

An example of this is a workshop where pupils of one school are undergoing work training. On the other hand pupils in the fourth through eighth grades from several of the rayon's schools are working in a production-training workshop which was recently organized in the Kalininskiy Rayon of Moscow. But, the organizational principles are the same here, i.e., a close bond between training and productive work, participation in the labor training upbringing of school children of the rayon's enterprises.

The experience gained in Ivarov Oblast is a good example of joint efforts between the schools and textile industry enterprises in work training for senior pupils. About one half of the pupils in the ninth and tenth grades are getting labor skills directly--in the production shops and training laboratories. At the end of the school year, ninth graders undergo production practice at the enterprises. During the summer vacations most of the pupils continue to work here. In 1982 about six thousand senior pupils produced textile goods during the vacation period totalling 12 million rubles. This kind of work with school pupils has contributed to the fact that 600-800 graduates of the oblast's secondary schools have been annually filling the ranks of textile industry workers in the course of the past years of the Eleventh Five-Year Plan.

Approximately 2,000 pupils in the ninth and tenth grades from 18 schools are training in the production-training combine of the Kursk Industrial Region. Work training is being carried out in 15 vocations as determined by local needs (lathe operators, milling machine operators, carpenters, sewing machine operators, salespersons, etc.). The shops and the training combines of the UPK are structural subdivisions of the rayon's enterprises (tractor spare parts plants, knitwear combine, and others) and are equipped with modern tools. Masters of production training, i.e., employees of the enterprises, teach the pupils and organize their productive work. Senior pupils fulfill the enterprises' orders in the course of their work training. For example, girls who are training to become sewing machine operators annually produce 150,000 to 200,000 rubles worth of goods. The ninth graders get their on-the-job training directly at the rayon's enterprises.

There are two inter-school combines in the Oktyabr'skiy Rayon of Moscow. One of the combines is an ordinary one, and the other specializes in the work training of senior pupils in vocations connected with computer technology and programming (computer operators, key punch operators, electronic equipment regulators, research programmers, and others). The Institute of Control Computers is

the single base enterprise of this combine. The Institute has fully equipped the UPK with all of the essential technology, and has assigned 20 of its staff to train the pupils.

Vocational orientation has become an essential element in the system of pupil work preparation along with work training, socially useful productive work, technical creativity, and agricultural experimental work. The goal of vocational orientation is to prepare pupils to choose a vocation that is in accord with their individual psychophysiological characteristics and the national economy's need for personnel. The component parts of this orientation are: Information about the vocations, the personnel needs, ways of obtaining the vocations, and job placement opportunities. This also involves publicity about the vocations that are most needed by the national economy, instilling in the pupils socially valuable motives for choosing vocations, consultation on problems connected with choosing a vocation, and ways of obtaining such vocational guidance. This work is carried out by school teachers, but personnel from industry and vocational educational institutions are also involved. Training-procedure vocational orientation offices which have been organized in most secondary schools are the centers for this kind of work. Vocational orientation for school children is also conducted by interschool UPK, primarily in preparing seventh and eighth graders for choosing a work training specialty in the senior grades. Most UPK have vocational orientation offices. In Lithuania and Latvia, even the rayon and city national education departments have vocational orientation offices. The latter are staffed by vocational orientation specialists.

At the present time, ways have been indicated for organizing a system for controlling pupil vocational orientation whose main functions would include the elaboration of plans and a calculated distribution breakdown of complete and incomplete secondary school graduates, coordination of efforts on the part of national education organs and national educational institutions, vocational-technical education organs, and organs and enterprises of the national economy and public organizations; rendering administrative and methodological assistance to the schools and interschool UPK's. Participating in the management of vocational orientation are planning organs, national education organs and those of vocational technical education, labor and social problems as well as interdepartmental organs. The latter include the commissions of the ispolkoms of the rayon and city Soviets of People's Deputies for pupil vocational orientation and job placement assistance for secondary school graduates, the oblast, republic, and Union interdepartmental soviets for youth vocational orientation.

Thus, the rayon and city offices coordinate vocational orientation operations for all the secondary schools and UPK's of the Latvian SSR. The vocational orientation office of the republic's Ministry of Education controls the administrative and methodological supervision

of the rayon and city offices. The highest organ in this regard is the republic interdepartmental council for youth vocational orientation of the Ministry of Education. That council includes responsible officials from the republic's Gosplan, State Committee for Labor, State Committee for vocational Education, industrial ministries, and others. The council's coordination group directs the work of ministries, departments, rayon and city commissions for vocational orientation and youth job placement, and the council's information and propaganda group directs the activity of the press, radio, and television in the area of youth vocational orientation. The scientific-methodological operations group organizes scientific research, and prepares appropriate recommendations. The council studies and disseminates advanced experience gained in achieving cooperation between the schools, enterprises and organizations, and the vocational technical schools. The schools and interschool UPK's are the centers of pupil vocational orientation operations in the republic.

The Lithuanian SSR Ministry of Education also has an interdepartmental council for vocational orientation. Sessions of that council characteristically involve the examination of such questions as "The Work of the Order of Labor Red Banner Silk Combine imeni Ziberts on Vocational Orientation and the Assignment of Young People to the Plant," "Experience Gained in Assigning Secondary School Graduates to Agricultural Work in the Kayshyadorskiy and Shilutskiy Rayons," etc. The republic's Ministry of Higher Educational Institutions has a public institute for vocational orientation which provides for the scientific elaboration of vocational orientation problems and the preparation of recommendations. A department of vocational orientation has been organized within the State Committee for Labor which, in the course of studying the national economy's requirements for specialists and mass vocation workers offers suggestions to the national education organs, the schools, and the interschool UPK's about directions that their vocational orientation work might take. The vocational orientation office of the republic's Institute for Advanced Training of Teachers is responsible for raising the qualifications of national education personnel in this area. Commissions of the ispolkoms of the Soviets of People's Deputies for vocational orientation and youth job placement operate in all rayons and cities of the republic. Vocational orientation offices operate within the departments of national education. These offices, which, as a rule, are staffed by three associates (head, method specialist, and physician), have two basic functions: The methodological supervision of vocational orientation work in the schools, and parent and pupil consultation. The vocational orientation offices are also in almost all of the republic's secondary schools.

A strengthening of cooperation between the schools and industry would be impossible without the support of advanced experience, without the dissemination of that experience, or without the identification and elimination of shortcomings. Often the assignment of enterprises

as base enterprises for schools is done on paper only. Frequently, assistance from such enterprises is limited to material assistance or the allotment of equipment. Therefore, the view taken by those that the relationship between the schools and the enterprises is one in which help is given and accepted, is fundamentally wrong. In the first place, the plant must participate in the work preparation of the pupils, not in the sense of assistance, but directly, as an interested party. In the second place, the school must also assist the plant, if, in the process for productive-training work, the pupils are to be instilled with a readiness for conscientious labor in the national economy.

Often the two sides become absorbed in presenting mutual complaints instead of seeking and finding ways of strengthening cooperation between themselves. There are still inter-school combines that have little resemblance to the second party of their purpose--that of production. Productive labor is totally or almost totally absent, and the training subjects have little to do with material production. It is in fact these kinds of combines that enterprises are helping from time to time, instead of systematically providing work for the UPK shops as they would to their own structural subdivisions. Approximately 10 percent of the ninth and tenth graders are getting labor training at the present time in the training shops of the enterprises. This is a very small number, particularly if one realizes that this kind of labor preparation for senior pupils can be quite effective when well organized, i.e., where pupils can acquire knowledge and skills, and work under real plant conditions.

Frequently, the types of senior pupil labor training in the secondary schools and inter-school UPK's hardly correspond to the local work force requirements of the national economy. In some schools little attention is given to developing pupil interest in vocations at either the base or nearby enterprises. It is no accident, therefore, that, as a rule, the vocational orientation offices in such schools lack information about nearby enterprises, about the substance of work there and working conditions, the need for personnel, and job placement opportunities. The information that is available is of a general character (the country's national economy sectors, vocations, etc.). The interdepartmental councils, and commissions for youth vocational orientation and job placement often limit themselves to adopting decisions on strengthening cooperation between the schools and industry, but devote insufficient attention to studying and disseminating advanced experience or to working out specific recommendations, or to checking on the execution of their own decisions.

The general educational school reform ought to be implemented in an active, planned, and purposeful manner. It is essential to organize new inter-school UPK's, and, particularly, training shops in the enterprises, to increase the "traffic capacity" of existing combines

and shops, and to secure productive labor conditions for all UPK's. A significant part of the school training workshops must be reorganized into production-training shops in which the pupils in the secondary grades will acquire labor skills by fulfilling orders of the enterprises and plants. Most of the pupil labor associations must be permanently in operation, and, as training shops of the inter-school UPK's that operate directly at the enterprises, they must act as their structural subdivisions. In addition to providing for the organization of labor training, vocational preparation, and socially useful, productive work by pupils, the enterprises and farms must provide not only material and financial resources, but also specialists, workers, and kolkhoz farmers in the capacity of foremen of production training of the inter-school UPK's and training shops, tutors, and supervisors of pupil labor associations. The industrial and educational organs must jointly organize the selection of these personnel and organize their preparation for training and teaching the school pupils.

It is important that all schools, inter-school combines, and extra-school institutions have technical and agricultural clubs geared to production, through which the school pupils can become familiar with production efficiency and inventiveness, and participate, to the extent of their abilities, in the development of a plant's technical and technological development. Personnel from enterprises, scientific institutions, and vocational educational institutions should be recruited for directing those pupils.

The level of vocational orientation work with school children must also be significantly raised. This can only be done together with production personnel who understand well the enterprises' and organizational needs for personnel as well as the worker qualities and his working conditions that are required by the various vocations. At the present time there is growing number of enterprises which are organizing their own vocational orientation service in which sociologists, medical personnel, and psychologists are being utilized. These specialists must be more actively involved in counseling pupils on medical, psychological, and other questions related to vocation selection, and in the preparation of teachers.

An important task is to intensify the polytechnical orientation of general education subjects and increase their role in the process of developing within the pupils a solid understanding about the scientific principles of modern production, its future development, and the main trends of scientific-technical progress. But in order to fulfill that task, teachers must have a profound knowledge about the technical and technological principles of modern production. This cannot be accomplished without the assistance of national economy specialists and instructors from technical and agricultural higher educational institutions.

One of the important problems confronting the schools is that of raising the level of economics education and pupil upbringing. This

means giving the pupils skills in the field of specific economics, the ability to perform elementary economic calculations, and instilling in the pupils such qualities as thriftiness and an assiduous attitude toward socialist property, etc. That problem must also be resolved in the process of labor training and the study of general education subjects, and primarily, by means of involving the pupils in actual economic relationships that are characteristic of labor production collectives. This is accomplished by organizing socially useful, productive work undertaken by pupils in pupil production brigades and other labor associations on a self-management basis and (complete or partial) cost-accounting, and on the basis of a collective contract. This cannot be accomplished by the schools alone without the participation of industry representatives.

It is only together with labor collectives that the schools can instill in its pupils a sense of public duty, active civil responsibility, and a communist attitude toward labor. The experience of the Khromatron Moscow Color Picture Tube Plant, the Magnitogorsk Metallurgy Combine imeni V. I. Lenin, and many other enterprises attest to the fact that cooperation between the schools and industry is particularly effective when the enterprise not only creates the material base for pupil work preparation, and not only assigns its personnel to train the pupils and organize their productive work, but also involves the school children in public and industrial life and purposefully influences the ideological-political and moral upbringing of the school youngsters by fully realizing the rich pedagogical potential of its own public organizations, its own labor collective, including Party and labor veterans and leading plant workers. This kind of activity might include the shop supervision of classes, individual and collective tutorship, systematic information to pupils about enterprise affairs, its successes and difficulties, problems, leading workers, and about young workers who are recent school graduates. This can also be the kind of pupil labor activity organization that makes the pupils participants in the fulfillment of enterprise production plans. This also means the inclusion of pupils into various aspects of plant activity; not only production activity, but the entire life of an enterprise's working collective. Consequently, before becoming workers, the senior pupils gradually "enter" the labor collective, as if they were becoming candidate-members, and adapt themselves to working conditions at the plant.

Guided by the Party and Government decisions on strengthening cooperation between the schools and industry for the purpose of improving the preparation of pupils for work, one also ought to be guided by the USSR Law on Labor Collectives and Increasing their Role in the Management of Enterprises, Institutions, and Organizations, which directly states that labor collectives facilitate the improvement of pupil labor upbringing and vocational orientation.

The union between the schools and industry is taking on a new character. Not only should the schools draw even closer to industry, but plant personnel must turn toward the schools. The enterprises should not merely be "kind sponsors," but, together with the schools, they must be active and responsible organizers of operations designed to build the labor and vocational status of youth.

COPYRIGHT: Izdatel'stvo "TRANSPORT," "Sotsialisticheskiy trud" 1984

6289

CSC: 1828/28

EDUCATION

TRAINING OF ENVIRONMENTAL PROTECTION SPECIALISTS INSTITUTED

Moscow VESTNIK VYSSHEY SHKOLY in Russian No 6, Jun 84 pp 32-36

[Article by Professor V. I. Krutov and Candidate of Biological Sciences A. P. Sadchikov, Scientific and Technical Council of the USSR Ministry of Higher and Secondary Specialized Education: "Scientists of Higher Educational Institutions for Environmental Protection"]

[Text] The organization of environmental protection measures is based on the knowledge and thoroughly scientific application of the laws of the development and functioning of nature. "...For the present we do not know the law of nature," V. I. Lenin indicated, "it, by existing and operating apart from and outside our knowledge, makes us slaves of 'blind necessity.' Once we have learned this law, which operates (as Marx repeated thousands of times) irrespective of our will and of our consciousness, we are the masters of nature."

In the decisions of the 26th CPSU Congress the problems of the improvement and development of physical production are linked fundamentally with the optimization of the interaction of society and nature. The elaboration of a number of programs and the solution of the most important scientific and technical problems of the complete use of natural resources are envisaged. Specific tasks in the area of the expansion of the research on the most important problems of environmental protection have been posed for the scientists of the country.

Special tasks face the higher school, at which scientific work is closely connected with the educational process, at which highly skilled specialists of the corresponding type are trained, at which these specialists are educated in the spirit of a considerate attitude toward nature and the efficient use of its resources under the conditions of the scientific and technical revolution.

The training of personnel in specialties, which are connected with environmental protection and the efficient use of natural resources, is being carried out at more than 250 higher educational institutions in 21 specialties--where specialists, whose work involves the use of natural resources or for the sectors of production with a particular influence on the natural environment, are being trained. For example, personnel are being trained in the specialties "The Technology and Recovery of Secondary Materials

of Industry," "The Trapping and Recovery of Dusts and Gases" and others for work on the protection of the environment from harmful emissions of industry; in the specialties "Land Management," "Plant Protection," "The Efficient Use of Water Resources and the Sewage Treatment," "Biology," "Geography" and many others for the protection and efficient use of land, timber, water and biological resources.

Special chairs, which train specialists directly in the area of environmental protection for various sectors of the national economy, have been established at Kazan, Tomsk, Rostov, Kazakh and several other universities.

Serious attention is also being devoted to the further training of personnel in this area at special faculties in new promising directions of science and technology. About 200 specialists with a higher education in the specialty "Ecology and the Increase of the Efficiency of the Use of National Resources" annually undergo further training with leave from work at 6 higher educational institutions.

Plans of the continuous ecological training of students, which are intended for the entire period of their education, are being implemented at higher educational institutions. For this elements of the corresponding knowledge have been included in the programs of the majority of general scientific and special subjects. The methods of the elimination of harmful discharges into the atmosphere and hydrosphere, the efficient use of natural resources, the protection of the animal and plant world and so on are the basic content of education here. Entire sections of such subjects as "Introduction to the Specialty," "Labor Safety Procedures" and "Soviet Law" are devoted to the socioeconomic, biological and legal aspects of environmental protection. In the course of dialectical materialism the methodological principles of nature conservation are covered and the philosophical essence of an economic problem--the conscious control of the complex processes of the interaction of nature and society in the age of the scientific and technical revolution--is revealed.

In pedagogical specialties the necessary knowledge in the area of nature conservation is given to the future teachers.

The theoretical instruction of specialists in the area of the use of nature is inseparably connected with practical training. Various aspects of this field of knowledge and the questions of the efficient use of natural resources are grasped by students in practical lessons and production practice and by graduates during probationary work. At many higher educational institutions the students devote course and graduation projects to problems of nature conservation; participate in thematic research work, and this, perhaps, is the most effective means of ecological education.

Educational work proper in this area is also being performed at all higher educational institutions. Student conservation groups have been organized at a number of educational institutions, first of all universities and pedagogical and agricultural institutes. They engage in the extensive promotion of knowledge on environmental protection among the population, and first of all among school children; wage a campaign against poaching and

speculation in fowl, fish and furs at markets and against the felling of fir trees before New Year's; participate in expeditionary work, in which they study rare species of animals and plants, identify and describe monuments of nature, organize game reserves and so on.

All this is aiding the patriotic education of young people.

Educational literature, of course, is a vital factor in increasing the level of ecological training of specialists. The publication by central publishing houses alone of only 20 textbooks and educational aids, which have a direct bearing on the problems of environmental protection and the efficient use of nature, is envisaged by the long-range plan for 1981-1985. In the past 3 years 15 books have been published, including: "Okruzhayushchaya sreda i chelovek" [The Environment and Man] by D. P. Nikitin and Yu. V. Novikov, "Priroda i zdorov'ye cheloveka" [Nature and the Health of Man] by P. G. Tsafiris, "Ekologiya" [Ecology] by V. D. Fedorov and T. G. Gil'manov and others.

In the matter of nature conservation and the efficient use of its resources an enormous role belongs to science, which is capable of solving many complicated problems of the use of nature.

The higher educational institutions of the country, which have a large scientific potential, are making a significant contribution in the accomplishment of the tasks of the efficient use of nature. At present about half of all the doctors and candidates of sciences of the most diverse specialties--humanities, natural and technical--work at higher educational institutions, which is making it possible to approach comprehensively the solution of complex problems of environmental protection.

Scientists of more than 190 higher educational institutions, which are a part of the system of the USSR Ministry of Higher and Secondary Specialized Education, are taking part in the research which is devoted to various aspects of these problems. They are elaborating about 1,300 major themes; minor operations on some aspects or others of nature conservation are being performed at another 50 higher educational institutions. In all 10 scientific research institutes of higher educational institutions and more than 50 problem and sectorial scientific research laboratories are making a significant contribution to the elaboration of these problems.

At higher educational institutions, for example, means and methods of monitoring are being elaborated, the effect of anthropogenic influences on the natural environment are being studied, they are engaging in the improvement of production technologies for the purpose of preventing harmful emissions and recovering waste products, many other basic and applied problems of the use of nature are being solved. In general it can be said that about two-thirds of all the research is connected with the improvement of technological processes, as well as with the protection of water and land resources and the atmosphere from industrial pollution, the questions of the protection of biological resources are in second place among the themes being elaborated, socioeconomic problems are in third place. Leningrad and Ural polytechnical institutes, Moscow, Leningrad and Rostov universities, as well as a number of other higher

educational institutions are the main organizations which are coordinating the research.

The most important comprehensive research is being conducted at Leningrad, Ural, Tomsk, Kuzbass, Orenburg, Novocherkassk and Kiev polytechnical institutes, Moscow, Leningrad, Irkutsk, Tomsk and Kemerovo universities, the Leningrad Forestry Engineering Academy, the Moscow Forestry Engineering Institute and many other higher educational institutions.

The participation of instructors, graduate students and undergraduates in such research is creating favorable conditions for the inclusion in the educational process of the latest achievements of science, and in the end ensures the improvement of the vocational training of specialists.

Being a comprehensive problem, environmental protection requires the combination of the efforts of scientists of various specialties. The goal program method of the organization of scientific research work at the higher school conforms to this requirement.

In the RSFSR Ministry of Higher and Secondary Specialized Education, for example, the comprehensive scientific and technical program "Man and the Environment," in the elaboration of which scientists of more than 100 higher educational institutions are participating, has existed already for many years. The regional approach to the organization of scientific research work, which is being implemented here, is making it possible to combine the comprehensive approach to the solution of nature conservation problems as a whole with the consideration of regional features.

On the basis of the example of the organization of the work on this comprehensive program it is possible to see the advantages of the goal program method of the organization of research work from the point of view of both the effectiveness and the introduction of their results on the national economy.

Such planning affords the opportunity to conduct extensive research at several higher educational institutions in accordance with a unified plan; to concentrate efforts and material resources on the most important scientific directions; to conduct research jointly with scientists of foreign countries; to improve the system of the organization, planning, coordination, financing and material and technical supply of the research of higher educational institutions; to improve purposefully the training of specialists in the area of the protection of the natural environment and the efficient use of its resources; to formulate more soundly in the scientific respect syllabuses and textbooks; to conduct all-union conferences and symposiums on the themes of the program.

Moreover, a number of programs, which are connected only in part with the problem of environmental protection, are being elaborated in the system of the USSR Ministry of Higher and Secondary Specialized Education. For example, 46 higher educational institutions are fulfilling the program "The Nonchernozem Zone," 5 higher educational institutions--"The Sea of Azov," 14 higher educational institutions--"Nature Conservation of the Industrial

Regions of Siberia on the Basis of the Example of the Kuzbass," also 14 higher educational institutions--"The Siberian Forest."

It is possible to name the following works as examples of the most interesting results. A forecast of the ecological changes, which might occur in the reservoirs of the Kama cascade and on the adjacent territories in case of the diversion of a portion of the runoff of the Pechora River to the south, has been made at Perm University within the Kama regional subprogram.

During the elaboration of the problem of the protection of land resources with the use of aerospace photography at the Novosibirsk Institute of Engineers of Geodesy, Aerial Photography and Cartography they obtained and interpreted photographs of the geothermal regions of Kamchatka. They will help to predict the eruption of volcanoes.

At a number of higher educational institutions of Leningrad the recreational influence on the ecosystem of Lake Ladoga and the Neva River was analyzed; recommendations on the decrease of the entrance of biogenic substances from farm lands into water courses have been formulated. Hydrocarbon mixtures, the addition of which to the fuel of motor vehicles makes it possible to decrease the toxicity of the discharged gases and fuel consumption, have been obtained at Leningrad Polytechnical Institute.

Scientists of Saratov Law Institute performed a set of operations connected with the evaluation of the efficiency of nature conservation measures in Saratov Oblast. They also elaborated recommendations for the improvement of the adopted methods of the organization of the planning of such work, its management and the analysis of the corresponding measures.

At the Voronezh Institute of Forestry Engineering research has been conducted in the area of the recultivation of dumps of the Kursk Magnetic Anomaly, recommendations on the cultivation of several species of acacias, alder, oleaster, poplars and willows, which are most promising for this region, have been drawn up.

Plans of the landscaping of several enterprises with plants, which are resistant to the atmosphere of these enterprises, have been developed at Kemerovo University; methods and means of obtaining special concrete with the use of cinders and ash have been developed at Lipetsk and Ural polytechnical institutes.

At the Novosibirsk Institute of Construction Engineering they have put into operation a plant for the production of gypsum items made from tailings of phosphogypsum. On the basis of the simulation model "The Sea of Azov," which was developed by scientists of Rostov University, the hydrological and hydrochemical changes, which occurred in this sea with the construction of the Taganrog dam, have been calculated.

Higher educational institutes are attaching great importance to the participation of student youth in scientific research work. Students are members of scientific groups which are conducting economic contractual and state budget research. A number of operations are being performed in

scientific circles and at specialized student scientific, design, technological and other bureaus. They introduce their developments during practical work and in the process of carrying out course and graduation designing; report the results of their research at scientific conferences and publish them jointly with scientific supervisors in journals and collections of scientific works.

The section "Nature Conservation and the Efficient Use of Natural Resources" was introduced 10 years ago in the themes of the annual All-Union Competition for the Best Scientific Work of Students on the Natural and Technical Sciences and Humanities. The significant increase of the number of works, which are being submitted to the competition, and the increase of their scientific and practical significance attest that the interest of students in this problem has increased noticeably. During the 1981/82 school year alone more than 200 works from 87 higher educational institutions were entered in the competition. Let us name several such works. Devices for the dispersal of useful insects for the purpose of the biological protection of cultivated plants were developed at the student bureaus of the Moscow Institute of Aviation and the Leningrad Institute of Mechanics. These devices are being used at kolkhozes of Moldavia and the Voronezh Preserve and at a number of plant protection stations. A radiochemical method and a device for the purification and treatment of the waste water of the Baykalsk Pulp and Paper Combine were developed at the student scientific laboratory of Belorussian University and were introduced at this enterprise. This work is of great practical importance for the protection of such a unique body of water as Lake Baykal from pollution.

In accordance with the results of the research conducted at higher educational institutions in 1982 alone 35 monographs, 38 collections of scientific works, 43 study aids and several thousand articles were published and about 400 authorship certificates for inventions and several patents were obtained.

A number of achievements in the area of environmental protection have been exhibited at the Exhibition of USSR National Economic Achievements and at all-union, republic and international exhibitions. Many of them have been awarded medals and certificates.

The most interesting achievements of scientists of higher educational institutions have been reported at many conferences and symposiums, for example: "The Protection of the Air Basin From Harmful Emissions" (Moscow), "The Laws of the Formation of Anthropogenic Landscapes" (Voronezh), "The Problems of the Ecology of the Lake Baykal Region" (Irkutsk), "Nature Conservation in Regions With Intensively Developing Industry" (Kemerovo), "Man and the Environment" (Petrozavodsk) and others. Scientists of higher educational institutions have also participated in several special seminars which were devoted to ecological education.

The Section of Environmental Protection of the Scientific and Technical Council of the USSR Ministry of Higher and Secondary Specialized Education, which is headed by Academician V. Ye. Sokolov, one of the most prominent Soviet ecologists, coordinates all research of higher educational institutions

in this area. The most prominent specialists in this area are members of the section.

The basic tasks of the section (in addition to purely coordinating tasks) are to formulate proposals on the improvement of scientific work at higher educational institutions, to evaluate the theoretical and practical importance of research and to monitor the progress of the fulfillment of scientific programs.

The USSR Ministry of Higher and Secondary Specialized Education, in turn, is devoting much attention to the broadening of research work in the area of the conservation and efficient use of natural resources and to the acceleration of its introduction in the national economy.

COPYRIGHT: Izdatel'stvo "Vysshaya shkola", "Vestnik vysshey shkoly", 1984

7807

CSO: 1828/37

END

END OF

FICHE

DATE FILMED

27 Dec 1984